NATIONAL INSTITUTES OF HEALTH

RESEARCH PLAN
December 1980
Supplement

U.S. DEPARTMENT OF
HEALTH AND
HUMAN SERVICES

Public Health Service
National Institutes
of Health

PROCEEDINGS OF THE ADVISORY COMMITTEE TO THE DIRECTOR NATIONAL INSTITUTES OF HEALTH

40TH AND 41ST MEETINGS
MAY 13-14 AND OCTOBER 20-21, 1980

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PROCEEDINGS OF THE ADVISORY COMMITTEE TO THE DIRECTOR NATIONAL INSTITUTES OF HEALTH

Health Research at Educational Institutions: Costs and Accountability

40th Meeting, May 13-14 1980

Federal Support for Health Research: NIH Funding Mechanisms and Policies

41st Meeting, October 20-21, 1980

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NATIONAL INSTITUTES OF HEALTH
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PREFACE

This document contains the proceedings of two meetings of the Advisory Committee to the Director of NIH, held on May 13-14 and October 20-21, 1980. The Committee, whose activities are closely linked to the NIH and HHS health research planning efforts, consists of 16 members drawn from diverse fields pertinent to the NIH mission, including biomedical and behavioral research, medical practice, the social and physical sciences, medical and other higher education, and biomedical communications. Among the members are persons knowledgeable about such matters as applicable law, standards of professional conduct and practice, and public health. The Committee is chaired by the Director of NIH.

As a public forum held approximately three times a year to advise, as appropriate, the Secretary of HHS and the Assistant Secretary for Health, as well as the Director of NIH, the Committee functions in a manner analogous to the Advisory Councils of the individual Institutes, except that it does not recommend approval for research grant applications. Instead, its advice centers on policy matters pertinent to NIH mission responsibilities and is intended to reflect a diversity of informed viewpoints on a wide range of issues. In addition, the Committee provides a framework for review, evaluation, and policy development on general or specific aspects of NIH activities.

During the past four years, the Committee has dealt with such key issues of health research policy as the initial preparation and revision of NIH guidelines for recombinant DNA research, development of a strategy and set of principles for HHS support of health research, and consideration of measures to provide a more stable foundation of support for research at the Nation's academic institutions. Pertinent proceedings from these earlier meetings were published in special planning documents.

More recently, the Committee has been examining the concerns of universities regarding (1) declining Federal support in the face of steadily increasing costs at research institutions, (2) continuing differences on standards for indirect cost charges, (3) institutional needs for more flexible funding arrangements, (4) the impact of regulatory requirements on the cost of doing research, and (5) Federal auditing procedures, especially for time-and-effort reporting. Representatives of the White House Office of Science and Technology Policy (OSTP), the Department of HHS (including NIH), the Office of Management and Budget, and the General Accounting Office expressed views generally sympathetic to many of the universities' concerns.

These issues have gained new urgency as a result of the recent revisions in OMB Circular A-21 dealing with cost and accounting principles for educational institutions. The revisions stemmed from Congressional and public perceptions of needs for improved documentation of costs by educational institutions in regard to research grants and for greater general accountability in use of Federal research funds. The revised Circular A-21, which became effective in October 1979, ties time-and-effort accounting to Federal funds and for the first time requires detailed information on teaching load and other academic activities of scientists that are not research-related.

Parallel with this action, the National Commission on Research, a private nonprofit organization established in 1978, has also examined the relationships between government agencies and universities involved in research and has presented specific recommendations in six reports. Three of these reports--"Accountability: Restoring the Quality of the Partnership," "Funding Mechanisms: Balancing Objectives in Resources in University Research," and "Industry and the Universities: Developing Cooperative Research Relationships in the National Interest"--have served or will serve as the basis for meetings of the Director's Advisory Committee. In addition, the Commission called for a public forum involving government, university, and public- and private-sector representatives to consider the government/university relationship and to guide its evolution. (It appears that the Comptroller General may be interested in such a forum.)

Discussions at the Committee's May 1980 meeting centered on indirect-cost and other cost-accountability issues, including the implications of A-21. At the October 1980 meeting, several alternative modes for funding and accounting for research activities were considered. These included:

- Modification of the existing grants system to permit (1) intermingling of funds between closely related grants and (2) automatic carryover between grant periods.

- Adoption of a "fixed obligation grant," which uses the present pre-award process for research grants but alters the post-award management and reporting process and centers responsibility within the institution. Only technical reports would be required by NIH, and time-and-effort re-reporting would be restricted to developing indirect cost rate proposals for the institution. Thus, the emphasis would shift from cost accounting to performance accountability.

- Adoption of the NSF model for indirect costs, which requires that, prior to award, the grantor and grantee establish the indirect cost rate and the project cost. If, during the course of the project, the indirect cost rate rises, the grantor allows the institution to use the new rate but provides no increased funds. Thus, the burden of negotiation on direct and indirect costs is left to the principal investigator and his institution.

Over the coming year, the Committee will continue its examination of the Federal/university connection and will also consider government/university/private-sector relationships.

It is intended that the proceedings of future meetings of the Director's Advisory Committee will constitute an integral feature of forthcoming NIH planning documents.

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1980

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PART I

PROCEEDINGS

Meeting of May 13-14, 1980

Agenda
40th Meeting of the Advisory Committee
to the Director, NIH

May 13-14, 1980

Building 31, Conference Room 10
National Institutes of Health

HEALTH RESEARCH AT EDUCATIONAL INSTITUTIONS:
COSTS AND ACCOUNTABILITY

TUESDAY, May 13, 1980

Morning Session

9:00	Introduction and Overview: Determining the Real Costs of Health Research	Dr. Fredrickson
9:30	Costs and Accountability: NIH-Supported Research at University of California (San Francisco)	Dr. Krevans Dr. Brown
10:00	Committee Discussion	
10:30	Coffee Break	
10:45	Costs and Accountability: NIH-Supported Research at University of Iowa	Dr. Eckstein Dr. Abboud
11:15	Committee Discussion	
12:00	Lunch	

Afternoon Session

1:30	Costs and Accountability: NIH-Supported Research at Washington University	Dr. Danforth Dr. Kipnis
2:00	Committee Discussion	
2:30	Cost Principles for Educational Institutions: Historical Overview	Mr. Kelly
2:50	Committee Discussion	
3:15	Cost Principles for Educational Institutions: HEW Perspectives on OMB Circular A-21 (March 6, 1979)	Mr. Bohen
3:45	Committee Discussion	
4:15	Coffee Break	
4:30	Cost Principles for Educational Institutions: OMB Perspectives	Mr. Lordan

4:50	Committee Discussion	
5:30	Adjournment	

WEDNESDAY, May 14

Morning Session

8:45	Introduction	Dr. Fredrickson
9:00	Accountability: Perspectives on the Government-University Research Relationship	Mr. Champion Mr. Carey
9:30	Committee Discussion	
10:00	Accountability: Restoring the Quality of the Partnership--Report of the National Commission on Research	Dr. Pings Dr. Wilson
10:30	Committee Discussion	
11:00	Coffee Break	
11:30	Accountability for Health Research Support: NIH Perspectives	Dr. Raub
11:50	Committee Discussion	
12:15	Concluding Comments	Dr. Fredrickson
12:30	Adjourn	

ADVISORY COMMITTEE TO THE DIRECTOR, NIH

Minutes of Fortieth Meeting
May 13-14, 1980

FIRST DAY: MAY 13

The fortieth meeting of the Advisory Committee to the Director (DAC) was held on May 13 and 14, 1980, at the National Institutes of Health, Bethesda, Md. Dr. Donald S. Fredrickson chaired. (See Attachment A for list of members and consultants and letter of invitation.)

Introduction and Overview: Determining the Real Costs of Health Research

Dr. Fredrickson stated that the issues to be discussed were matters of concern not only to NIH and to the biomedical research community; their import was Government-wide and university-wide. These issues, moreover, transcended simple considerations of "public accountability." They involved a confrontation between state and science--two independent systems of human endeavor. NIH was a particularly appropriate forum for addressing these issues, since it provides approximately a third of all R&D support to universities.

Dr. Fredrickson said he did not expect the Committee to solve the problems relating to accounting of costs for health research; some of these have defied resolution for 20 years or more. But he believed that the Committee and consultants together could share some perceptions of the problems faced and agree on a few small steps toward a better understanding between the interested communities.

Dr. Fredrickson pointed out that NIH, in preparing the agenda for this meeting, had the advantage of a brief related meeting sponsored earlier this year by the Association of American Medical Colleges. That meeting had helped to frame many of the issues, and had included statements by a number of capable spokesmen representing widely divergent views. (See Attachment B for the minutes.) Especially helpful also was the report of the National Commission on Research, Accountability: Restoring the Quality of the Partnership (Attachment C). The second day of the present meeting would be devoted mainly to this report.

Over the past four years, continued Dr. Fredrickson, the meetings of the Advisory Committee to the Director have provided a public forum for key issues in national research policy. The Committee's record is a distinguished one. For example:

- Through the initial development and first revision of NIH guidelines for recombinant DNA research, the Committee provided the essential forum for airing highly divergent views on the nature and possible control of risks associated with this powerful new research tool, and advised the Director, NIH, on how issues appeared not only from a scientific but from a broader public perspective.

- It played a key role in the development of a set of principles to guide HEW in its allocation of resources for health research.
- More recently it has engaged with options and problems in attempting to provide a stable foundation of support for research at the Nation's academic institutions.

The Committee, in now taking up cost and accountability issues as these affect the academic science sector, confronts important problems that Dr. Fredrickson noted have been present as long as there has been Federal funding for biomedical research. The focus on these issues has intensified recently for several reasons: the impact of inflation on research costs and available institutional resources, a leveling off of Federal funds for research, and a recent major revision of cost and accounting guidelines for Federal support of research in academic settings. In aggregate, these problems now disturb the long and fruitful partnership between the Government and academic science institutions. Particular issues, such as "accountability" in general, "indirect costs," "time-and-effort reporting," etc., could be considered and analyzed separately. However, they all intersect and interact.

Dr. Fredrickson stated that he accepted the risk of oversimplification in identifying four major groups with differing perspectives on these issues. This is no simple competition between the university and the Government. Within the Government there are the Federal program managers and auditors on the one hand, and within the university, administrators and scientists on the other. These four groups align themselves in different ways in multiple areas of tension and potential conflict. Ineffective communication adds to the aggravation.

There is an interface where the demand for fiscal accountability beats against the desire for maximum flexibility and minimal record-keeping. Here an aggregate Federal view is likely to find itself arrayed against an equally aggregated university view. Within research institutions, tensions arise between administrators insisting that all research-related costs must somehow be met by Government patrons, and scientists insisting that funds provided for the support of particular research projects must not be used for other purposes. Tensions may also build between Federal auditors and Federal program managers when demands for accountability seem to stand in the way of program missions.

One of the great problems, according to Dr. Fredrickson, is the lack of opportunity for these differing groups to talk over the issues and at least reach a common appreciation of one another's perspectives. The purpose of today's meeting, he said, is to search for that elusive understanding. Consensus and resolution, however, may have to await another day.

In developing the agenda for this meeting, NIH had tried to engage a diversity of interests and perspectives within the Government and the universities.

A special feature of the program would be presentations by investigators and administrators from the same institution. In the day-and-a-half meeting, the Committee would examine:

- The real costs of doing health research; from the standpoints of both the scientist and the administrator;
- Federal perspectives on issues of cost and accountability--particularly in relation to revised OMB Circular A-21; and
- Recommendations of the National Commission on Research on (1) accountability at academic institutions and (2) the broader issue of the Federal-university science relationship.

It was Dr. Fredrickson's hope that the meeting would lead to a better understanding of the real costs of doing research, both in a basic science setting and a clinical setting. The direct and indirect components of those costs would be examined. A second most important issue related to proper accountability for use of public funds at research institutions--a matter of increasing concern to the Congress, the Executive Branch, and the greater public.

Some of the specific questions that needed to be examined were these:

- Are the Federal documentation standards for use of research funds at academic institutions reasonable, or are they needlessly cumbersome and, indeed, incompatible with the university environment?
- Has the rapid rise in the indirect costs of doing research reduced funds directly available for research? Why have these increases varied so widely among institutions? Are there adequate incentives to keep these costs at a minimum?
- Some critics have alleged diversion of funds from authorized research projects. Is there any basis for such an assertion? What is the impact of these transfers on the peer review system?
- Are current Federal regulatory practices unreasonably burdensome for academic institutions? Do they retard the progress of research?
- University spokesmen have asserted that current methods for monitoring the conduct of research are inappropriate--that greater emphasis must be accorded the concept of self-regulation. In view of these contentions, is the time opportune to fashion a new research compact between the Federal Government and academia?

Dr. Fredrickson then turned to the first major item on the agenda, "Costs and Accountability: NIH-Supported Research at the University of California (San Francisco)," to be discussed by Dr. Julius Krevans, Dean, University of California School of Medicine, and Dr. Kenneth Brown, Professor of Physiology, University of California.

I. COSTS AND ACCOUNTABILITY: NIH-SUPPORTED RESEARCH AT THE UNIVERSITY OF CALIFORNIA (SAN FRANCISCO)

A. Remarks by Dr. Brown

Dr. Brown noted that in his role as a member of the Advisory Council to the National Eye Institute, he has been urging consideration of escalating indirect costs incurred in connection with research project grants. (See Attachment D for a paper prepared by Dr. Brown for the Eye Council, Attachment E for definitions of indirect costs provided by Dr. Wilson, and Attachment F for a relevant editorial from *Science* magazine.) Dr. Brown noted that two of the four groups mentioned by Dr. Fredrickson--the granting agencies and the researchers--have very little to say about setting the levels for indirect costs. Basically, it is the university administrators and Federal auditors who negotiate annual rates, with very little input from the granting agencies or researchers, although these groups are also strongly affected by indirect costs.

Dr. Brown then turned to a review of costs related to his NIH grant (Attachment G). He stated that in some respects this is not a typical grant: it is one of the largest R01-type grants awarded by the National Eye Institute and is now in its 20th year. It is believed typical, however, of the type of basic research that is supported by the National Eye Institute, and of the type of research that is conducted at UCSF with NIH support. More importantly for present purposes, it is believed typical in showing the kinds of research costs that UCSF charges as direct costs to grants supported by NIH.

In discussing direct costs associated with his grant, Dr. Brown first noted that he charges less to the grant for his salary than is warranted by the time actually applied. He next pointed out the many items that are charged to direct costs under his grant. Indeed, at UCSF many services are handled as direct costs which one might expect to be handled as indirect costs at some other institutions. For Dr. Brown's grant these services include mechanical and electronic shop work, secretarial work, animal care, medical illustrations, photographic services, and the use of a scanning electron microscope facility. In most cases these are paid for by recharges to the grant for specific services rendered. The office of Dean Krevans has provided Dr. Brown with the estimate that approximately 75 percent of the full costs of these services are paid for by charges to grants, with the remaining 25 percent paid for by the university and not recovered.

In effect, the university is not charging the full cost of these services to his grant. However, a key policy at UCSF is that all items properly attributed to direct costs are charged to direct costs.

B. Remarks by Dr. Krevans

Dr. Krevans observed that although the University of California has nine campuses, a single overhead rate is negotiated for the entire system. Thus, the rate is an average for the system as a whole. Within this context, the individual campuses have discretion on what they wish to ascribe to indirect cost within guidelines and what they wish to charge directly to the grant. Dr. Krevans noted that if each campus were to negotiate separately with the

Federal Government, there would be a threefold difference between the campus with the lowest indirect cost rate and the campus with the highest.

Dr. Krevans indicated that the university began last year to prepare for negotiations of the indirect cost rate, with the tentative result that the rate would have to be increased. However, as a result of concerns expressed by the faculty senate, the university is currently reconsidering the matter.

The major issue here, according to Dr. Krevans, is support for research and education. He noted it would be simpler, from an auditing point of view, to separate the two, but felt that both would suffer as a consequence. The strength of the university lies in its unique mix of these functions. However, he recognized the concerns of researchers, such as those expressed by Dr. Brown. He pointed to the disenchantment of faculties with the "cloudy curtain" drawn between them and the money they generate for the universities through their efforts. Dr. Krevans felt that the indirect cost rate was reasonable and that it was appropriate to expect researchers to make a contribution to the administration of research. He noted, however, that there were problems in terms of incentives to keep indirect costs low, and in the distance between managers and investigators in the matter of indirect costs.

Further complicating the issue of indirect costs were the increasing number and complex administrative requirements imposed on the universities by the Federal Government: OMB Circular A-21, rules regarding Institutional Review Boards and Equal Employment Opportunity, and an array of other regulatory requirements--all to good purpose, but demanding more and more people to monitor these activities. Federal regulations also require maintenance of pertinent data, resulting in higher indirect costs. Dr. Krevans noted in conclusion that much more has to be done to bring the various interested groups together to seek solutions.

C. Committee Discussion

Dr. Fredrickson asked Dr. Krevans whether he had any data on the contribution of time-and-effort reporting to increased indirect costs. Dr. Krevans said he did not, but added that development of such data would in itself add to indirect costs. In this connection, he noted that the budget for the Dean's office is approximately $1 million--that this has been kept roughly level simply because Dr. Krevans avoids spending money on the kinds of studies implicit in Dr. Fredrickson's question. Mr. Kelly inquired about the faculty's reaction to time-and-effort reporting. Dr. Krevans replied that the University of California has developed recommendations to OMB for easing Circular A-21 requirements, but even with these, the faculty is not enthusiastic, to say the least.

Dr. Fredrickson asked if there was a role for faculty in setting indirect cost rates at the University of California. Dr. Krevans reported that the Board of Regents delegates authority to the faculty senate on academic matters. All matters are therefore reviewed by that body. The indirect cost proposal, as mentioned above, was reviewed by the faculty senate, and it was on the basis of its reservations that the president withdrew the draft request for an increase of the indirect cost rate.

Dr. Temin asked (1) how one could account for the threefold difference in the indirect cost rate among the campuses (assuming that they were computed independently), and (2) if California does not recover all indirect costs, where the money comes from for the unreimbursed portion. Dr. Krevans responded that UCSF has a lower indirect cost rate because the university does less for the faculty and more is billed to the direct cost of the grant. On other campuses the indirect costs are higher because more services are provided through them. Dr. Temin replied that if that is the case, Dr. Brown is in effect subsidizing the other campuses because the researchers there don't have to pay for some of their costs.

In response to a discussion comment that faculty at the University of California seem to have been strongly involved in setting indirect costs at their university, Dr. Brown pointed out that faculty involvement of this type has been insignificant until recently. It was only in 1979, in response to a proposal that the indirect cost rate be increased from 31 percent to about 56 percent, that faculty participation first became noteworthy. Perceiving that the effects upon research support might be severe, the university Committee on Research responded to faculty requests and took up this issue. As a result the rate of 31 percent is being continued, pending further study of the matter.

Dr. Brown went on to clarify what he considers the nature of faculty dissatisfaction. In his mind the "cloudy curtain" cited by Dr. Krevans is a factor, but not the primary one. More critical is the situation in NIH budgets that increased indirect costs lower the funds available to faculty investigators for supporting the direct costs of their research. At issue is the mechanism by which indirect and direct cost funds are determined. The indirect costs are well protected from inflation by two effective methods. First, indirect costs are a percentage of direct costs, so they are protected against inflation in the same manner as a waiter's tips, even if there is no increase of the indirect cost rate. Second, the indirect cost rate is renegotiated annually. By contrast, direct costs have neither protection. Also, as the indirect cost rate increases, indirect costs consume an increasing fraction of the total NIH budget, and the fraction available for direct costs must decrease correspondingly. Thus the direct cost funds suffer from the very protections that are enjoyed by indirect costs. This situation seems quite serious because it strongly limits how far NIH budgets can go in the support of research. Since that is the main function of the extramural research budget, this matter should be a special concern to granting agencies and to all university personnel that are concerned with the support of university research.

Dr. Fredrickson asked Dr. Brown whether he had a breakdown of the direct/indirect cost ratio over the 20 years of his grant. Dr. Brown responded that he didn't, but that the indirect cost rate at UCSF has risen only slowly. He noted that his attached paper shows the indirect cost rate for NIH, averaging across all grantees, to have increased from 28.5 percent to 41 percent over the period from 1970-79. His paper also shows that over that period the indirect cost rate increased very greatly at some universities, while there was little or no increase at others.

Dr. Eisenberg stated that the problem of faculty complaints about the basis for computation of indirect costs has a long history. Unfortunately, too many faculty members are parochial in their interests, concerned only with the successful operation of their own laboratories and not with the wider needs of the school as an institution. Further, many refuse to believe what they are told about indirect costs because it is convenient to do so. It is true, as Dr. Brown emphasizes, that so long as the research budget is fixed, funding for direct costs is decreased when indirect costs increase. That, however, overlooks the essential question: Are the indirect costs appropriately charged to research? Unless the figures supplied by the medical school are misleading or false, then the total of direct plus indirect costs is an accurate reflection of what it costs to do research. This discussion makes it clear that there is a need within the university for better communication between faculty and administration or both will suffer. "It must bring joy to the hearts of those who question the support of science altogether to have scientists claim that administration is overcharging."

Dr. Krevans observed that conceivably one could test whether the university itself would be willing to meet the indirect cost of the grant. In his view, this would result in only very wealthy universities being able to afford research.

Concerning the question of incentives to reduce costs, Dr. Danforth pointed out that such incentives were built into the negotiations between the university and the Federal Government on setting the rates. Universities may want to charge more, the Government to pay less. Through this tension, costs are held down.

Dr. Ramey noted the dilemmas perceived by faculty. On the one hand, university administrators urge faculty to get as many grants from the Federal Government as possible in order to help the institution. The perception of faculty is that the university benefits and indeed profits from this course. On the other hand, when faculty express concern about the indirect costs, administrators respond that Federal accountability requirements and regulations attendant to the grant place administrative demands on the university--that research increases the indirect costs. The message seems to be that grants are burdens, and the administrative officers do not exist for the investigators' benefit. Yet they are seen as reaping an advantage from the grants.

Dr. Anlyan felt that one must look at the broader picture of university income and expenditures. It is clear that tuition pays for only 10-15 percent of education. The rest comes from endowments and other sources of income. Similarly, research grants do not pay the full costs of research; it is not a self-supporting system. In the medical school and academic health center, a major source of income for support of research and education is patient care service. In fact, about two-thirds of the income of the academic health center and medical school comes from patient dollars. Dr. Anlyan believes one ought to consider direct and indirect cost issues and OMB Circular A-21 in the context of the financial profile of the academic health center.

Mr. Kelly spoke to the issue of whether indirect costs measure the efficiency of the university. In his view they do not. He pointed out that, as the breakdown of Dr. Brown's grant shows, what is charged to direct and indirect costs varies considerably. If, for example, charges were transferred from the direct into the indirect cost category, then the indirect cost rate would of course be much higher at UCSF, but without any change in the efficiency of the system. He noted, however, that relations between institution and faculty might be improved if there were more direct charging for the grant so that the researcher could see specifically where his money was going.

Dr. Kipnis said that the same questions of faculty vis-a-vis research also occur in regard to faculty vis-a-vis practice. Specifically, the question heard is how income from patient care is being used by the administration. Dr. Kipnis stated that it is most important to consider such questions in the context of the nature, mission, and functions of the university. The environment is one of scholarship. As the university pursues its unique missions, indirect costs may far exceed what is allowed under OMB Circular A-21. The costs of recruiting faculty, for example, are not included in the circular, yet these represent a direct cost to the institution. And he pointed out the difference between the academic and business environments. Many researchers could triple their income in the private sector but choose to remain in the university because of the academic environment. He deplored the fact that the administration of research funding and of health practice funding is driving a wedge between faculty and administration at new institutions.

The meaning of indirect costs also varies from institution to institution, and this too should be taken into account. Dr. Wilson felt that one ought to make an important distinction: that indirect costs are based on an average cost and not on an incremental basis. Averaging costs is a Federal rule, and examination of these issues must proceed in this light. While Drs. Ramey and Eisenberg described faculty perceptions accurately, it must be noted that these perceptions are incorrect. What is critically important is that there be far more communication between university administrators and faculty.

In regard to the issue of shifting costs from one grant to another, Mr. Kirschenmann felt the question was ultimately one of judgment. At what point did one wish to stop such inter-grant cost transfer? Further, he recognized faculty's distrust of accountants, but saw the problem as one of management. He felt that trust could be restored by spelling out the mechanisms for faculty involvement in management decisions.

Dr. Hansen expressed concern about indirect cost calculations. For her grant at the University of Michigan, a much higher indirect cost rate applied than would be the case at UCSF, yet many service costs were charged to her grant, as was true for Dr. Brown's. Dr. Sullivan asked about the contributions of the university to Dr. Brown's salary for time spent on his grant. Was this a deliberate policy of subsidy? He noted that other institutions with limited funds could not provide such a subsidy. Dr. Krevans responded that, historically, faculty salaries were paid entirely by the university. This is changing at most universities, and now the University of California encourages faculty to charge their salaries to the grant. This is determined, however, by each individual faculty member in consultation with the Dean's office.

Dr. Fredrickson then turned to the next item on the agenda concerning NIH support of research at the University of Iowa. He called on Dr. John Eckstein, Dean of the College of Medicine, and Dr. Francois Abboud, Professor and Head of the Department of Internal Medicine at the University of Iowa, to discuss research costs at their institution.

II. COSTS AND ACCOUNTABILITY: NIH-SUPPORTED RESEARCH AT THE UNIVERSITY OF IOWA

A. Remarks by Dr. Abboud

Dr. Abboud observed that the major problem in the Government-university relationship is the accounting for research expenditures. He noted that time-and-effort reporting in particular was leading to an erosion of trust between the two partners. He went on to point out how difficult it was to partition an intellectual effort. Rigid accountability required an exact knowledge of costs and benefits, which was unattainable. Dr. Abboud then mentioned the number of contributions made by patients participating in clinical experiments for the benefit of future generations, and the work of investigators who often put far more time into their work than might be accounted for on grants.

Dr. Abboud then discussed three different mechanisms at the University of Iowa through which funds are awarded by NIH. He noted that the cardiovascular center, which he heads, has approximately $5 million in income derived from 14 separate funding sources. He then focused on three types of NIH grants at the center. The first is the program project grant. Approximately 65 percent of the grant went for personnel costs and 28 percent for supplies. The indirect cost was 61 percent of salaries and wages. Dr. Abboud pointed out, however, that faculty time dedicated to this grant is far in excess of what is charged to the grant. Faculty support from the grant accounted for $137,000 whereas the actual salary for the effort was $364,000. Thus, the Federal contribution was 38 percent and the university contribution 62 percent.

Dr. Abboud then examined an institutional training grant, with indirect costs fixed at 8 percent of the total. The last mechanism he discussed was an individual NIH research grant.

Dr. Abboud concluded by noting the importance of the Government-university partnership, in which a common goal is to preserve and foster creativity. In this context, perfect accountability is a delusion, and overregulation will only lead to increased costs and instability for the research system.

B. Remarks by Dr. Eckstein

Dr. Eckstein observed that the categories for indirect costs at the University of Iowa are similar to those employed at the University of California, which were reviewed by Dr. Krevans. According to Dr. Eckstein, indirect costs are real and indeed could be listed as direct costs. Indirect costs vary from institution to institution, based on management practice, utility costs, the age of the buildings, local labor costs, and other factors. Consequently, rates cannot be standardized for all institutions.

Dr. Eckstein then explained the categories of indirect costs at Iowa. The indirect cost rate is calculated on the basis of a research pool structured from categories of cost allowance under Circular A-21 (e.g., buildings and equipment, operation and maintenance, general administration, library services) divided by salaries and wages. Indirect costs, according to Dr. Eckstein, do not go back to the department. They are budgeted for the use of the university. There is no profit for the university in indirect costs, and it must pay from its own budget those not recovered. Indirect costs, moreover, are going up rapidly. Much of this is due to government regulations--not necessarily related to research--such as OSHA and EPA and Affirmative Action rules. In this context, university financing is becoming increasingly difficult.

C. Committee Discussion

Dr. Fredrickson asked if there were any figures for those portions of indirect costs not reimbursed by the Government. Dr. Eckstein indicated that Iowa is recovering approximately 75 percent of the indirect costs of research. He was uncertain whether this was the total or the costs allowable under OMB Circular A-21.

Mr. Kelly observed that much of the research supported is clinical and involves a teaching hospital. A pertinent question was whether research support is being provided from funds obtained from patient care. An increasing amount of research is conducted in the hospital setting, and it was appropriate to ask whether patient care income should be used for that purpose.

Dr. Hansen asked whether indirect costs are increasing disproportionately to direct costs. Dr. Eckstein said that indirect costs appear to be increasing more rapidly, which isn't surprising in view of such things as escalating utility rates.

Dr. Bondurant provided information on unrecovered indirect costs at the University of North Carolina, Chapel Hill. For the period 1978-79, there was $63 million in awards, for which $15 million was incurred in indirect costs and $9.3 million recovered. Therefore, $5.7 million--38 percent--was not recovered from the Federal Government; and this was only for indirect costs allowable under the categories of OMB Circular A-21. If one could consider other costs, such as creating an environment for research or recruiting staff, it would have been more.

Dr. Bondurant went on to point out that basically one must look at these problems in light of the forms of research support in the United States. There are other ways to channel dollars into research. For example, the Federal Government could contract with principal investigators, who could then choose particular institutions in which to conduct the research. (An important variable, presumably, in the selection would be a low indirect cost rate.) On the other hand, the Federal Government could simply endow selected universities and let them divide the research among themselves. Between these two possible systems are a number of others for consideration. Dr. Bondurant concluded with the observation that much of the current misunderstanding is due to the ambiguities that have developed over time as to the definition of responsibility and the authority of the institution in relation to principal investigators and Federal agencies.

Dr. Brown asked Dr. Eckstein whether the indirect cost recovery was keeping up with inflation at the University of Iowa. Dr. Eckstein said that there was a lag of two years since there is an annual negotiation for indirect costs based on the previous year's costs, and those rates then apply to the upcoming year. At the University of Iowa, indirect costs now constitute 61 percent of salary and wages, or approximately 35 percent of the total direct costs.

Dr. Ramey pointed out that research grants are used to train the next generation of researchers. The costs of training are hidden in the grants because of the rules and regulations. Dr. Krevans remarked that some of the best research is in fact done by trainees supported on training grants. Dr. Wilson, as a followup to Dr. Bondurant's remarks, noted that the grant system presently employed is excellent in choosing good research, but is not the best for ensuring the accountability and administration of grants.

Dr. Temin said there was a great deal to learn about the calculations for indirect costs. He recognized that university administration is not making a profit. He cited Leon Eisenberg's phrase of "creative fiction" for auditors' numbers and inquired into the meaning of these numbers. Perhaps the universities, like some corporations, need two kinds of books, one for the Federal Government and one for other purposes. The auditors can't seem to accept the premise that scientists do many things at once. He specifically sympathized with the university administration regarding the number of Federal regulations, and raised the question whether NIH couldn't help in negotiations with other agencies of the Government to reduce the costs of adhering to regulations that may not be appropriate for laboratory workers. He inquired what NIH was doing to decrease the number of other kinds of expensive regulations.

III. COSTS AND ACCOUNTABILITY: NIH-SUPPORTED RESEARCH AT WASHINGTON UNIVERSITY

After lunch Dr. Fredrickson turned to the next agenda item, "NIH-Supported Research at Washington University." He called on Dr. William Danforth, Chancellor of the University, and Dr. David Kipnis, Chairman of the Department of Medicine, Washington University School of Medicine, to discuss cost and accountability issues as these pertained to their institution.

A. Remarks by Dr. Kipnis

Dr. Kipnis said that resolution of the accountability issue wouldn't flow from formulas for direct or indirect costs. Basically, the question is a philosophical one. Political decisions have been made to control the costs for research support, and the technocrats are there to enforce them.

Dr. Kipnis then reviewed three kinds of grants the NIH has with Washington University School of Medicine. For the first type, he selected a young investigator on his first research grant. Approximately 50 percent of the grant is for salary--75 percent for the investigator and 15 percent for the technician. Rarely do the researchers apply their full salary to the grant. This is a consequence of rigorous review by study sections, which has an inhibitory effect on claims for full salary reimbursement. The indirect cost for this grant is 37 percent of total cost.

Dr. Kipnis noted in this context that on a five-year grant, inflation takes a particular toll on the direct cost portion, which is fixed. By contrast, the indirect cost portion is negotiated and updated annually. He thus agrees with Dr. Brown's concern regarding inequity in the process for the direct cost portion of the grant. He went on to note that for the grant under discussion no money was put in for alterations or renovations of physical plant. He pointed to 15 years of neglect at the universities in regard to physical plant and noted the very small portion of the total NIH budget devoted to upgrading physical facilities.

Dr. Kipnis then presented information on a grant by an investigator in his 19th year. For this grant, ongoing, the indirect cost was 35 percent of total cost. And again, for reasons cited above, the investigator does not list his complete salary applicable to the grant.

Finally, Dr. Kipnis reviewed a center grant in its 20th year, which supports 32 clinical beds. Here, total indirect costs are less than 9 percent. Over the life of the grant, there has been no renovation of this clinical research unit. Bed occupancy is 80 percent, and the per diem is approximately $210--less than half the cost for a regular hospital bed. Since the allocation of dollars has not kept up with the enormous increases in cost, there is additional support from the university and hospital. It is virtually impossible, Dr. Kipnis believes, to allocate time for research versus education and service, and it is a sham to enforce such rules. He also noted that there are no incentives in the present system or under OMB Circular A-21 to protect the academic research environment. If a surgeon, for example, were to limit his income to aid academic development, that would only serve to reduce the base for calculating the indirect costs recoverable from the Federal Government.

B. Remarks by Dr. Danforth

Dr. Danforth, viewing research broadly, indicated that in 1978, out of a total of $6 billion expended nationally for basic research, approximately $4 billion went to universities and the remaining $2 billion to industry and government laboratories. This research was largely funded by the Federal Government. He noted that the costs of research administration are high and that capital investment is also significant. At Washington University, he said, there exists a strong commitment to sustaining the research environment.

Total income at Washington University in 1970 was $70.9 million. Of that amount Federal research grants and contracts accounted for 34 percent. In 1975 total income was $115.4 million, with the Federal Government providing 32 percent. In 1979 income was $175.5 million, of which Federal grants and contracts accounted for a total of 29 percent. Thus, the Federal Government contributed approximately a quarter to a third of the institution's total income. General tuition has increased 36 to 44 percent as a proportion of university income, while income from medicine (largely derived from patients' fees) went from 28 to 39 percent in the period 1972-79. Gifts and grants from private sources have been sought with vigor, but endowments have been severely eroded by inflation.

Private universities, according to Dr. Danforth, have special problems. For the nonmedical part of the university, inflation is met by decreasing the number of faculty and by limiting salaries. Gifts and grants from private sources have not kept pace.

Dr. Danforth pointed out that the university cannot by itself afford to fund more than a fraction of the research now performed. However, it is making a contribution, since it is not receiving full reimbursement for the indirect costs. Research under Federal grants in 1978 cost $49.6 million, of which $40.4 million was reimbursed by the Government. Thus, the university had to put up $9.2 million of its own--18 percent of the total. This came from endowments, gifts, etc. Unfortunately, the university cannot afford to budget more for research. Rent factors, including utilities and depreciation, have had a significant impact on indirect cost rates, causing a rise of 17 percentage points in nine years. However, looked at in a different way, reimbursement for indirect costs has remained almost constant (about 4 percent of total university income) during this period. Since the nature of Washington University has not changed significantly, he concluded that the indirect cost reimbursement needed to maintain the research environment has not changed relative to other university costs. Dr. Danforth noted that in the present university climate the number of faculty complaints is growing--and that he is spending more and more of his time on accounting questions.

Dr. Danforth concluded by making a series of recommendations. First, indirect costs should not be tied to individual grants. The university does not negotiate indirect costs on this basis and would prefer an approach based on some kind of aggregation. Second, consideration should be given to two indirect cost rates: one for rent to cover facility costs, and another for nonfacility costs, such as general administration. This might help the researcher and members of Congress to understand better the nature of the costs. Third, the Federal Government--and especially the Congress--should recognize that indirect costs are as essential to research as are direct costs. Fourth, there is a need to simplify reporting and accounting requirements, especially in regard to faculty time and effort applied to research.

C. Committee Discussion

Dr. Temin asked whether there should be total recovery of indirect costs from the Federal Government. Shouldn't the universities also contribute to research? Universities were not necessarily neutral brokers. Philosophically, research could be considered an integral element of the university's mission, as is teaching.

Dr. Danforth responded by noting that Washington University has an enormous commitment to research in terms of facilities and equipment, but that fiscal pressures on the university have been so great that it cannot bear any cuts in Federal indirect cost contributions. He noted, for example, that there are 600 grants at Washington University, and the institution must cover gaps in indirect costs derived from them. It simply lacks the resources to cover this volume of research.

Dr. Meadow remarked that research and education are vital missions of the university, but each university must decide for itself on the nature of its commitment to research. In effect, there is no fraction of university effort for research that is optimal. A university could not, however, grow and develop without the necessary research support. If recovery couldn't be made, then nonresearch components would have to be penalized.

Mr. Kelly felt that one could not set a standard for how much reimbursement a university must get. Each institution must decide the optimal amount in its own framework.

Dr. Bennett pointed out that low indirect costs seem to be good for administrators. He went on to note that NIH has a pool of dollars to adjust indirect costs, unlike the Department of Defense where no such pool exists and where rate increases in indirect costs must be recovered completely from the contract. NIH has an enlightened policy in this regard and provides some protection for indirect cost increases.

Dr. Eisenberg said that if the university could recover full costs, it would be better able to foster its research and educational missions. Perhaps one could argue that the NIH budget should be strictly devoted to direct costs, with later appropriations to cover the uncontrollables of indirect costs. This practice is followed in the social security system, and perhaps we need it here as well.

Dr. Wu observed that the issues discussed here relate to all scientific research, not just the life sciences. For instance, at her institution--Columbia University--indirect costs are negotiated between the Office of Navy Research and the university. The decision is based more or less on NIH funding, as this is the biggest. Nevertheless, the rate of indirect costs thus determined is applied to all other Federal fundings.

She concurred with Dr. Brown and others that the researchers must have a large say in the discussions on indirect costs, and that the universities must include the research faculties in this question. It is essential for the credibility of the program.

Dr. Fredrickson then turned to the next agenda item for the afternoon, "Cost Principles for Educational Institutions--OMB Circular A-21," and called on Mr. James Kelly, retired Executive Vice-Chancellor of the State University of New York, for a historical overview.

IV. COST PRINCIPLES FOR EDUCATIONAL INSTITUTIONS: OMB CIRCULAR A-21, MARCH 6, 1979

A. Historical Overview

Remarks by Mr. Kelly

Mr. Kelly began by noting that he had served in the Office of the Secretary, HEW, from 1954 to 1970. During his tenure he helped establish grants administration policy, created the HEW audit agency, and participated in development of the original OMB Circular A-21. He had a long-standing interest in the development of NIH. The best kind of accountability, he observed, was to be found in the rise of the United States to a position of world preeminence in biomedical research. This accountability had nothing to do with direct or indirect costs. It had a great deal to do with the contribution to man's knowledge concerning disease, and to disease prevention and promotion of health. He said that there had been 14 independent outside evaluations of NIH. Each had suggested some improvements, but each had affirmed that public funds were being wisely spent.

In March 1953, when HEW came into being, the NIH budget was $59 million; today it is $3.4 billion. In the period since 1953, a number of profound decisions have been made affecting the health research enterprise. First, it was decided that rather than undertake an expanded effort in Federal laboratories, the predominant effort would be made in non-Federal institutions, but with a significant amount of intramural research (approximately 10 percent). Second, there was the decision that research would not be conducted at exclusively research institutions, but would be performed at educational institutions. Third, the grant rather than the contract mechanism would be used. Mr. Kelly felt that this was a mistake, since the grant was ultimately made to assume the character of a reimbursement contract.

The key issue, according to Mr. Kelly, was the fiscal health of the institutions on which the Nation relies for the conduct of research. Its promotion was dependent upon (1) weeding out fraud and misrepresentation and (2) encouraging efficiency and economy of performance. Fraud is most destructive of public policy and must be dealt with quickly and severely. But efficiency and economy of performance, while desirable, are not achievable in an absolute sense. Mr. Kelly noted that with the creation of the HEW audit agency under Elliot Richardson, a major policy change occurred which, in Mr. Kelly's view, was not entirely correct. This was the application of a more substantial effort to recover costs and to deal with audit problems retrospectively. Except for fraud, the problem is one of economy and efficiency and should be dealt with prospectively.

In regard to time-and-effort reporting, Mr. Kelly cited a study conducted in the 1960s which showed that 95 percent of time-and-effort reports were identical with the estimated time-and-effort data on the grant applications. Perhaps it was not a very useful exercise, but such reporting was an incentive to ensure that the investigator kept as his benchmark the time-and-effort statement in his grant. However, there were a number of problems. An investigator, for example, who initially indicated on his application that he would spend less than 20 percent of his time on the grant, but who actually spent more than that, would only be reimbursed on the basis of the 20 percent estimate. This was basically unfair. However, Mr. Kelly was not persuaded that investigators cannot estimate time and effort. They do it to establish a salary for the grant, and they should be able to do it for the time actually spent. He did suggest that a grant-by-grant accounting of time and effort was simply not reasonable--that there must be an aggregation of faculty time spent on sponsored research.

Mr. Kelly concluded with certain recommendations. Perhaps one could take an economic view rather than an accounting view to assist the universities and restore their fiscal health. A key issue currently is the deterioration of physical plant. Mr. Kelly suggested that the Government consider allowing the full cost of depreciation for physical plant, irrespective of the source of funding. He would remove the current restriction against allowing depreciation on buildings financed by the Federal Government.

Committee Discussion

Dr. Sherman remarked that the whole question of cost-sharing needs to be examined in terms of its origins and whether it has achieved its purposes over the past decade.

Dr. Brown, noting Mr. Kelly's comments about concentrating on the future, observed that the next decade looks grim, especially with NIH budgets leveling off, indirect costs rising, and funds for direct costs being thereby reduced. Direct cost funds indicate the amount of research supported. He emphasized once again that the present mechanism for indirect cost determination permits indirect costs to grow, but that no similar mechanism exists for adjusting direct costs. He also pointed out that faculty are becoming increasingly aware of less funds for direct support of research as indirect costs rise. The process is likely to accelerate over the next decade. Thus, something seems urgently required to change the nature of this process.

Mr. Kelly remarked that the increased costs of doing research without an increase in total research resources has resulted in diminished support for research. However, much of the increase in indirect costs is attributable to the six-fold increase in utility costs, and if that were removed, the increase in indirect costs wouldn't be as large. For example, administrative costs at SUNY over a 15-year period remained at about 5 percent and maintenance at about 4 percent, while the costs for utilities and fringe benefits have boosted indirect costs significantly.

B. OMB Perspectives

Remarks of Mr. Lordan

Mr. Lordan noted that the House and Senate Appropriation Committees called for revision of OMB Circular A-21 four years ago. As a result, HEW began considering such revisions and subsequently made recommendations to the OMB. The OMB then circulated the proposed revisions and, on the basis of comments received, further revised the circular. A draft was published in the Federal Register, and after more revisions based on the results of several meetings with university groups, the OMB published a final version in March 1979, with an effective date of October 1979 (see Attachment H).

Mr. Lordan indicated that there would be no further revisions at this point. At issue now is the implementation of the circular and consideration of problems arising out of that. He noted that the National Commission on Research called for a reconsideration of the circular in 3 to 5 years, which seemed a sensible approach. Mr. Lordan recognized that there would be difficulties in the implementation, but felt that the universities would be able to cope with it, particularly as the revised circular was better than the old. Studied efforts have been made to avoid the level of detail typified by DOD procurement regulations. Moreover, he said, the present Administration is committed to reducing the amount of paperwork, and the current circular in many instances accomplishes this end. For example, the circular has simplified reporting for smaller institutions, and has provided options such as the "monitored workload" to facilitate effort reporting. There has also been a reduction in the frequency of faculty activity reports, which are now required only once each academic term rather than on a monthly basis.

Mr. Lordan indicated that Congressional and public concern led to revision of Circular A-21 as a means of ensuring credibility in the accounting for public funds. The central issue now, he concluded, is effective implementation of A-21 by the universities.

Committee Discussion

Dr. Eisenberg said that the philosophical issue here is whether universities should be treated in the same manner as business, through Federal regulation. He suggested that perhaps the OMB could undertake studies to determine the cost/benefit of auditing procedures and whether these indeed justify the cost to the public. He thought it would be very helpful to have experiments at selected universities to determine the overall consequences of these requirements and their implementation.

Dr. Kipnis felt that the credibility issue did not derive from the public's distrust of the health sciences. Indeed, several polls indicate a high level of public confidence in medical and health research. In his view the matter was not one of accounting but of policy determinations made by the Government.

Mr. Lordan said that standards for accounting of funds are set by joint agreement, and while these standards may be unfair, they are intrinsic to the nature of the agreement set between the Government and the universities for accounting of public funds. Dr. Kipnis observed that OMB discourages support for research from non-Federal sources. He said it was the universities' view that private sources of research funding should pay less for indirect costs than the Federal Government. Mr. Lordan disagreed. He felt that the Federal Government and any other donor ought to treat indirect costs in the same fashion--that this was a key policy dispute.

Dr. Wilson said that it might result in easier accounting to treat Federal and non-Federal sources in the same manner, but that in terms of overall policy, it constitutes a disincentive to other sources of research support. She noted that the issues lie in the policy objectives. Accounting should be a tool to accomplish the agreed upon objectives. Unfortunately, the decision on revision of A-21 occurred prior to the establishment of genuine agreement on policy objectives so that costing principles are driving policy determination.

Dr. Ramey voiced her agreement with Drs. Kipnis and Wilson that the circular discourages non-Federal sources from providing support for research. She noted that the Federal Government in the long view would encourage more private support for research and enhance research capacity if it did not insist on imposing identical cost requirements for treatment of overhead. Mr. Lordon responded that the premise, accepted by the Congress, seeks accountability through the application of accounting principles. The appropriate forum for this debate, he said, is the Congress. The applicable principle is that all who contribute to research support should bear the burdens of indirect costs equally.

Dr. Bennis observed that a period of declining funds is often attended by an increase in paperwork. He noted that the present system is too suggestive of T.S. Eliot's technocrats building a system so that no one has to be good. Mr. Lordan retorted, "This is a world we never made," and reaffirmed the necessity of allaying public concerns and suspicions about appropriate use of the tax dollar.

Dr. Wilson noted certain changes in the new A-21 which may create problems--for example, the change related to the interpretation of cost sharing. In the matter of credibility, she observed that recent studies have shown that only 6 percent of funds expended have been set aside as unauditable because of inadequate documentation, primarily in the area of time-and-effort reporting. Only 0.2 percent of expenditures were questioned as improper charges, and these questions again are largely in the area of time-and-effort reporting. Thus, the universities' systems are quite good, and the pertinent issues seem to be the cost/benefit of these procedures. The essential problem is the development of an appropriate management technology.

Mr. Kirschenmann distinguished between two perspectives: (1) the view of universities that the Federal Government should treat them as resource centers and (2) the Government concern with expenditures under individual research project grants. For each of these, the cost principles are different. The current auditing system reflects project accounting, not institutional accounting. In the past, he said, costs associated with projects have not been well documented, and thus the accounting procedures have led to better information on the real costs of doing research.

Dr. Eisenberg noted again the need for some experiments in examining the implementation issues concerning the circular. Mr. Lordan responded that perhaps NIH could fund the experiment. It would be especially urgent to examine the issue of fixed-price vs. cost-reimbursement mechanisms. Mr. Kelly felt that the fixed-price grant might be the more attractive of the two. Dr. Wilson said that the next report of the National Commission will urge experiments with grants-in-aid, managed and accounted for at the local level.

Dr. Ramey agreed with Dr. Kipnis in regard to the public's conception of research. In her view, there is a high level of support for this effort. Mr. Lordan responded that if public polls were taken on the specific issue of Federal support for the indirect costs of research, a more negative view might emerge, similar to that now entertained in the appropriations committees of Congress. At present there appears to be wide acceptance of the need for greater accountability of public funds. The problem is to find levels of accountability that would be generally accepted.

Mr. Meadow observed that all the discussions to this point had demonstrated that there was a lack of credibility among the interested parties. Secondly, it was evident that the present system was an adversarial process. He believed that today's meeting could begin to resolve this problem of mutual mistrust.

Dr. Anlyan again voiced concerns about A-21. Its implementation comes at a very difficult time, when the morale of the researchers is particularly low.

Dr. Temin suggested that perhaps the term "direct costs" ought to be changed to "incremental costs," and "indirect costs" to "average costs." Another distinction that could be made was between "productive" vs. "unproductive" costs. Mr. Kelly commented that in the '50s one assumed incremental costs could be estimated, but few today believe this is possible.

C. HHS Perspectives

Remarks by Mr. Bohen

Mr. Bohen said that the Department was surprised at the negative reaction elicited by A-21. He noted the extensive process of consultation as outlined by Mr. Lordan, and considers the current version of A-21 to be a much improved and less onerous document than its predecessor. Indeed, the Department views A-21 as a stride forward and believes it should now be tested in the universities.

Mr. Bohen agreed with Mr. Kelly in his comments about emphasizing prospective remedies rather than retrospective penalties in terms of auditing. He did point out, however, that large sums of money are involved. The University of California, for example, has $1 billion in Federal grants and collects approximately $77 million in indirect costs. Thus, accountability is a key issue here. He further noted that under continuing budget constraints the Department cannot continue to have protracted, open-ended audit questions. The Congress is demanding action, and the Department therefore must expedite these reviews and reach a resolution of outstanding questions.

D. Committee Discussion

Dr. Eisenberg asked Mr. Bohen why the Department was surprised at the distress of the universities. Mr. Bohen said he recognized that the universities had problems but, considering the extensive consultation in developing the new circular, the reaction that followed was not anticipated. He emphasized that the universities should give the circular a chance. And more experience with A-21 is required before it can be revised again.

Mr. Bohen said that HHS is trying very hard to get the auditing teams to assist the universitites in upgrading their procedures, and he asked Mr. Kirschenmann for a brief description of this effort. Mr. Kirschenmann reported that he and his colleagues had made a number of site visits to universities to establish a system for implementation of A-21 acceptable to the universities and the HHS auditing agency. They dealt with 40 institutions, and agreements on procedural aspects with 6 to 8 of these institutions have been reached. Mr. Kirschenmann said that A-21 is not rigid--that it seeks approximation and allows certain alternatives. Indeed, time-and-effort reporting should result in a reduction of paperwork. Mr. Kelly asked whether any universities had noted that application of A-21 would reduce Federal reimbursements for indirect costs. Mr. Kirschenmann replied that they had not yet reached the stage where a determination of this nature could be made.

SECOND DAY: MAY 14

Introduction: Mr. Kelly

In response to a request from Dr. Fredrickson, Mr. Kelly provided his perspectives on the issues raised in the course of the first day's meeting. He found the meeting a useful exercise, even though the issues discussed had been debated for the past 30 years. A new feature of the program was that all interested parties were considering the issues in a public forum, and for the first time a multidisciplinary approach was provided, embracing a number of perspectives--financial, research, administrative, government, and university.

In his view, the first day of the meeting may have been devoted to "kicking the wrong villain." Much of the discussion seemed to concentrate on whether the new OMB Circular A-21 constituted a threat to research programs and impaired national objectives. In his view the new circular was not significantly different from the old, and the old has been around since World War II. He believed that as the budget tightens and the forces for a balanced budget continue, accountability--the "bad word" of the Eighties--will apply. This will necessarily lead to increased surveillance. Clearly, the system must be attended to, for it is now unsatisfactory in several respects--such as time-and-effort reporting and the methods for auditing and the disclosure of auditing results.

Mr. Kelly noted the difficulties inherent in time-and-effort reporting. Historically, HEW stopped it for a time, changed to a payroll distribution system, and then reverted to the former practice. Mr. Kelly considers the approach unreliable. Some promise is afforded, however, by the monitored workload system contained in A-21.

Yesterday's discussion, according to Mr. Kelly, brought out two interesting points. The first was the extent to which the universities now have accounting systems that can determine total indirect costs and how much is not reimbursed by the Government. This reflects a far more sophisticated record-keeping system than was the case, say, 10 years ago. The second point was the concern, especially by the research scientist, that the mechanisms for calculation of indirect and direct costs need review. Specifically, he addressed Dr. Brown's point that indirect costs are negotiated annually, while direct costs are not. Thus, we do need changes in mechanisms to adjust for inflation of other costs; it is a fair criticism of the system. Mr. Kelly added, however, that we must not have a system that would adjust too easily to inflation, for there would be no incentive to control inflation from a public policy standpoint.

Mr. Kelly went on to note that from the university's point of view, there seemed to be an element of harassment by the Government in the proliferation of regulations, though many had laudable goals. Auditing is "just another straw to break the camel's back." Monitoring must exist, but it should minimize harassment with procedures that limit the frequency of reporting and surveillance. We need to review carefully how we can achieve this goal.

The Federal Government must also examine the question of reimbursement. The grant mechanism has served us well, but it was designed for a system in which the research volume was measured in millions of dollars--rather than in billions, as is the case today. Clearly, we must review this mechanism to determine if it is still appropriate or if it is contributing to present difficulties in regard to accountability. Perhaps the reimbursement agreement ought to be replaced by the grant-in-aid. The smoke generated recently may be an indication that the present system is hazardous to the Federal-university research relationship.

Dr. Fredrickson then turned to the next item on the agenda, "Accountability: Perspectives on the Government-University Research Relationship," and asked for presentations by Mr. Hale Champion, Executive Dean of the John F. Kennedy School of Government, Harvard University, and Mr. William Carey, Executive Director of the American Association for the Advancement of Science.

I. ACCOUNTABILITY: PERSPECTIVES ON THE GOVERNMENT-UNIVERSITY RESEARCH RELATIONSHIP

A. Comments by Mr. Champion

Mr. Champion said that in his work as director of finance of the State of California, the University of Minnesota, and Harvard, he became very familiar with the questions of indirect costs and Federal audits. As former Under Secretary for HEW, he was also familiar with the Federal perspectives on these issues. He recognized that Federal auditors have real problems dealing with the accountability requirements set by Congress, especially with respect to documentation by universities. The auditors must account for Federal funds through existing accounting practices and procedures. He then observed that the universities are not notoriously sympathetic to auditors' problems.

Mr. Champion said there were fundamental problems with the Circular A-21 approach. Any system that tries to allocate indirect costs and to document what someone is doing for money already reimbursed will always have problems. And these will continue with increasing scarcity of funds and tough budgets.

Arguing over the details of Circular A-21 will not solve all these problems. It only puts more pressure on them and on all the parties and increasingly draws Congressional attention and heat which will further reduce the funds being haggled over. The emphasis ought to be on what virtually everyone agrees is true--that university-based research is the best bargain, that regardless of the auditing and accounting details, the Federal Government is getting higher quality at less cost than in any of its other research support activities, with the best training of future researchers thrown in as a bonus. If the Congress and OMB understood that, they would be much less concerned about onerous documentation.

The Federal Government is in part responsible for some of the problems that have emerged under A-21. Many of the charges made as a result of audits are clearly unfair. Further, many audit reports are publicized and cause embarrassment to the universities. Government reform is badly needed here.

In Mr. Champion's view, indirect costs are as important to research as direct costs, and public discussion of this issue is unproductive. With regard to time-and-effort reporting, this did not make sense before determining the costs of a program. A new approach may be needed, perhaps use of another mechanism, such as the grant-in-aid. Mr. Champion also felt that there might be some merit in using outside nonadversarial auditors: there appears to be a built-in conflict of interests between the Government auditors and the Government program managers in dealing with the university. The cost-sharing argument should once and for all be dropped. It was clear from the presentations at the meeting that the universities are not being reimbursed for all costs incurred, and therefore, to continue these debates is totally unproductive. Finally, in Mr. Champion's view, NIH must take the lead in developing new compacts with the universities.

B. Comments by Mr. Carey

Mr. Carey observed that a malaise was evident in the relationship between the Government and the university. This did not originate in questions regarding the usefulness of science, for there was overwhelming public approval of Federal support of research. The difficulty arose largely as a consequence of the Government "bearing down" on research universities. Mr. Carey also noted that the grant mechanism is a victim of public psychology: a grant sounds very much like a gift or subsidy and is subject to public attack in times of scarcity. Thus, in sum, the Government deflects the heat it gets onto the universities through the regulatory process.

In Mr. Carey's view the universities are hostages to the Government. Over the years they have given up more and more of their authority to the Government, and now the latter holds most of the cards. What was once a partnership has become an "administered relationship." The Government has captured most of the benefits it can from that relationship, and many of its policies are becoming counterproductive. Mr. Carey then distinguished between the two endeavors of science and administration: science seeks excellence; administration, perfectibility. Thus, the expectations are different. Furthermore, science is open-ended and dedicated to knowledge development, while administration is incompatible with open-endedness and concerned with the protection and justification of resources. The Government has clearly overstepped itself, and the quality of the relationship is consequently decaying. We must move to a practice that prevailed earlier--an audit of research, rather than an audit of the administrative process. At the moment the issue seems to be whether the dollars are used as intended, rather than whether the research itself is excellent. Mr. Carey felt that the administrative barriers have detracted from research, probably reducing productivity by a third. He noted Mr. Meyerson's comments at the AAMC meeting (see Attachment B) that out of a budget of $400 million, $4 million was going for Federal paperwork requirements.

Mr. Carey concluded by noting the difficulty in obtaining precise documentation of the impact of these administrative requirements on research, specifically on the time and effort needed to fulfill the requirements themselves. He said that if such documentation could be obtained, it might lead to a change in the perceptions of the Congress.

C. Remarks by Mr. Fuller

Dr. Fredrickson then called on Mr. Fuller of Duke University for his comments. Mr. Fuller pointed to a number of concerns about the revised OMB Circular A-21. He said that Duke would attempt to use the monitored workload system, but that it will need the cooperation of the faculty and administration and, certainly, the understanding of the Federal auditors. He indicated, however, that the university would be penalized by the new A-21--that it wouldn't be able to recover as many of the indirect costs as it did under the old circular. For example, the new circular provides specific details on cost allocation, whereas in the previous circulars these were framed in more general terms that provided latitude for the university. Precise allocation techniques for determining the costs will lead to a decreased allocation to research. Further, the burden of proof has shifted from the Government to the universities in the use of alternate allocation systems, and it is feared that these would only be allowed if they involved diminished cost reimbursement.

Mr. Fuller went on to note that depreciation is not allowed on buildings constructed with Federal funds and, further, that indirect costs for training grants continue to be limited to 8 percent. He concluded by observing the inconsistencies among Government agencies in regard to overhead cost recovery and the need to standardize Federal practice.

Dr. Fredrickson then called on Dr. Cornelius Pings, Vice-Provost and Dean of the Graduate School of the California Institute of Technology, and Dr. Linda Wilson, Associate Vice-Chancellor of Research at the University of Illinois, to summarize the recent report of the National Commission on Research.

II. ACCOUNTABILITY: RESTORING THE QUALITY OF THE PARTNERSHIP--REPORT OF THE NATIONAL COMMISSION ON RESEARCH

A. Remarks by Dr. Pings

Dr. Pings said basic information about the Commission is included in its report (see Attachment C). He did note, however, that the Commission is primarily concerned with the administration of research funding rather than the funding per se. As indicated in the report, the Commission was founded in 1978 by the American Council on Education, the American Council of Learned Societies, the Association of American Universities, the National Academy of Sciences, the National Association of State Universities and Land-Grant Colleges, and the Social Science Research Council. Funding has been obtained from the Carnegie Corporation of New York, Exxon, the Ford Foundation, the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, the National Science Foundation, the Department of Defense, and the Department of Energy.

Approximately 8 of the 13 members of the Commission are from universities. The Commission organized its work into five subcommittees, which are each responsible for developing a report. No final overall report is planned. All five reports will be issued before June 30, when the Commission will go out of business. The subcommittees are as follows:

- Accountability,
- Alternate funding mechanisms,
- Quality assurance of the review process (peer review),
- Research personnel, and
- Government/universities business relationships.

Dr. Pings noted that the Commission has an excellent relationship with several of the Federal agencies, some of which testified before the Commission. The Commission has held several regional hearings: at the University of Wisconsin, Cal Tech, and Stanford, and the AAAS meetings in San Francisco in 1979. He emphasized the difficulty in obtaining hard documentary evidence to support many of the issues under review by the subcommittee on accountability. He characterized A-21 as not a problem, but a symptom. The process for the development of the A-21 is not sound. It is a patch-up of standards developed by the Office of Naval Research after World War II, and clearly a new approach is necessary. Finally, he said that the costs of the accountability process should be justified.

B. Remarks by Dr. Wilson

Dr. Wilson observed that the Government and the universities share many characteristics. Both are highly complex, evolving, and diverse--and have limited resources. Both have individuals in positions of responsibility who hold a variety of views on the proper relationship between government and higher education.

But there are deeply rooted institutional differences. A central issue in their relationship is accountability. The problem for the public is to ensure that the best research is produced and that public funds are not wasted or abused. The problem for the Government is to fully realize its programs and to fulfill its stewardship responsibilities. The problem for the universities is to make sure that research is done well and that the integrity of the institution is protected.

Major areas of concern are constraints, costs, and control. The Commission in its review noted two opposing contentions: (1) the Government contends that the university systems are in many instances inadequate as regards accounting, and (2) the universities contend that Government procedures are inappropriate for the knowledge-development process. It is important to keep in mind that the process for which accountability is sought takes place in three stages: the selection of research, the conduct of research, and the reporting of research results. The procedures and operating understanding of one stage do not always interact constructively with those of another stage in the process. The major areas of contention are: documentation standards in regard to time-and-effort reporting, cost sharing, and cost transfers.

According to Dr. Wilson, time-and-effort reporting is a key problem. The focus here is on the process rather than the outcome of the research. A-21 may create problems because accounting is now required for 100 percent of the professor's time, and this is a fundamental change from the earlier version where the focus was on time spent in research. For the university, there is no common definition of what constitutes a 100 percent effort and no standards for the work week--nor should there be from the university's perspective. The diversity in institutions precludes the application of uniform rules. There must be flexibility in the system.

Dr. Wilson noted that the Commission had spent several months working at these issues. The Commission is convinced that there would be further deterioration in the Government-university relationship if rules were tightened. It is essential that new processes and procedures be considered and that OMB Circular A-21 be revised substantially in the next 3 to 5 years. Dr. Wilson then summarized and reviewed each of the recommendations of the Committee. (See Attachment C, pages xi-xii.)

Dr. Wilson closed by noting that the next report of the Commission will be on funding mechanisms and that relevant recommendations would urge clarification of cost-sharing rationale and requirements. Moreover, there will be a number of recommendations on the elements in the array of funding mechanisms, including the grant-in-aid.

C. Remarks by Dr. Mac Lane

Dr. Fredrickson then called on Dr. Saunders Mac Lane, Vice-President, National Academy of Sciences, for his perspectives. Dr. Mac Lane referred to his analysis of OMB Circular A-21 (see Attachment I). He asserted that the requirement for a 100 percent accounting of a professor's time is simply not feasible and, indeed, contrary to the purposes of the university. He noted that the National Academy of Sciences passed a resolution at its annual meeting on April 22, 1980, that expressed reservations concerning Circular A-21 and recommended that it be reconsidered.

Mr. Kirschenmann observed that even if there were not a requirement for time-and-effort reporting, universities would still need a mechanism for determining expenditure of faculty time in order to compute indirect costs, as these are frequently based on salaries and wages. He said that over the past 10 years, HHS has been trying to elicit alternatives from universities, but none has been forthcoming.

Dr. Mac Lane continued that the accounting process, which is inappropriate for purposes of the university, is now driving the system. For example, the new HHS interpretation of OMB Circular A-21 would require reports not only on a professor's changes in time spent on a grant but also detailed information on teaching load and other activities per semester. Such things may have their place in accounting, but are simply not useful to a university. Dr. Wilson agreed that universities don't need this level of detailed documentation from the professors to ascertain changes of significance in the work load.

Dr. Welsch noted that much of the discussion focused on universities, but that 10 percent of the NIH budget goes to single-purpose research institutions, such as the Worcester Foundation for Experimental Biology. A principal concern here was the costs vs. the benefits of accounting rules.

Dr. Fredrickson then turned to the last item on the agenda, "NIH Perspectives on Accountability for Health Research Support."

III. ACCOUNTABILITY FOR HEALTH RESEARCH SUPPORT: NIH PERSPECTIVES

Introduction

Dr. Fredrickson said that the Committee had not yet heard from the Government program managers. Dr. William Raub, Associate Director for Extramural Research and Training at NIH, would provide this perspective. First, however, Dr. Fredrickson commented that we need to reach out toward each other to avoid being entrapped in ideologies that make us unable to join in common purpose. At worst the scientist is myopic--not seeing beyond his door to the broader dimensions and multiple purposes of the university. The university, concerned with the risk of bankruptcy, seeks to generate income, and this has led to administrative discomfort. The auditors, in pursuit of their professional responsibilities, are using blunt tools in attempts to adapt science and research to molds actually constructed for commerce.

Dr. Fredrickson observed that one reason for the inadequate participation of NIH in setting the conditions for accountability was that the quality control this agency exercises over science activities has always served a more important guarantor of effective use of funds than fiscal accounting by itself. NIH has also been reluctant to mix program directly with audit. Thus, some of the fault lies with the Federal program managers. Dr. Fredrickson further noted that, in effect, there are two universities: one representing the traditional concept characterized by a common tendency to provide science and scientists with faculty rank and tenure through institutional resources; the other, a more recent reflection of the Federal-academic partnership, characterized by a broader scientific community whose creation and employment are determined, wholly or in part, and periodically renewed, by a system in the charge of Government officers. These officers have tended to ignore some of their responsibilities for stewardship of the second university--through willingness to believe that it is effectively assumed by the first. Dr. Fredrickson added that NIH will have to address this whole interrelated set of concerns more forcefully in the future, and to do so in concert with the research-intensive universities. This meeting represents an important beginning.

Comments by Dr. Raub

Dr. Raub remarked that apropos of the Commission's recommendations, there were three areas where agencies could make contributions. In regard to progress reports, these were already required on all noncompeting grants and included a narrative on the scientific effort and a detailed financial report. The latter has been deleted because of the OMB initiative three years ago to reduce financial reporting to a minimum. NIH, however, is now adding more structure to the report on science to get a better sense of the expenditures on personnel, equipment, and other cost items.

The recommendation related to aggregation (No. 9) provides a special opportunity for NIH. Dr. Raub noted that there was little reference in the Commission's report to program project or center grants. Yet these are mechanisms which provide a great deal of flexibility in the handling of dollars. There are good and bad points about this system, but PHS grants policy provides for limited discretion in aggregation of salary costs when there are more than two grants accounting for one salary. However, Congressional action would be needed before this could be applied across several Institutes, especially if one wanted to extend the principle to supplies, equipment, and the like. But here is an opportunity.

The recommendation pertaining to a carryover of program funds (No. 10) provides a dilemma for the program managers. For example, NIH notes that 5 percent of the dollars awarded for noncompetitive grants are not expended--an amount that could provide for additional grants each fiscal year. Here we confront the issue of flexibility in regard to the awarding of new grants, or the alternative issue of carrying these funds over. Perhaps a tradeoff might be made in the fixing of indirect costs.

Committee Discussion

Mr. Kelly asked Dr. Raub whether science reporting under grants is well documented. In the past, he noted, many of these reports have not been filed by the grantee. Dr. Raub replied that this is not a problem, especially since the reports are required for renewal of the grant.

Dr. Sherman said that this meeting had been remarkably useful in the effort toward reaching consensus and in the clarification of issues. A key issue that had emerged was whether the project grant, though it may be excellent for selection of research, should continue to be the backbone of the NIH system, because, as Dr. Wilson and others had pointed out, it causes problems in administration. Do we need to reexamine this, or should we reaffirm the grant as the basic unit for doing research, since it has stood the test of time? Dr. Bondurant pointed out the necessity for balance between program accountability and fiscal accountability. Dr. Welsch remarked that from his point of view the 5 percent carryover would be far better used for the initial grantee than for creating new grants.

Dr. Eisenberg pointed out that penalties for error in the audit are disproportionately harsh. The rewards in the auditing system are for finding errors, not for demonstrating that 98 percent of the system is clean. The Congress, in other words, rewards those who have found flaws in the system rather than those who have not found them. Dr. Wilson observed that the project grant is indeed the backbone of the system, as had been noted earlier, but that it is limited by administrative problems. She noted that scientific accountability on a grant-by-grant basis is not feasible, and is fraught with dangers. The Commission believes it is much better to have a retrospective evaluation by fields.

Mr. Meadow commented that there seemed to be a lack of mutual understanding among the group during the day-and-a-half meeting, that we had been talking past rather than to one another. He noted, for example, in connection with scientific accountability that a principal responsibility of any faculty is the determination of the scientific progress and status of its members or prospective members for purposes of appointment, continuation, or promotion. He believed that many of the issues raised at this meeting, if they are to be resolved, will require Congressional action--for example, authority to mix expenditures from various appropriations. He noted that many of the issues raised here have been raised for the past 30 to 40 years and that the solution in many instances lies not with the universities or the Federal agencies but with the Congress.

In concluding the meeting Dr. Fredrickson noted that this type of meeting appeared to provide a useful public forum for review of issues from many perspectives. Perhaps further meetings were needed. In any case, the National Commission report, in effect, provides a practical framework for addressing many of the problems between the Government and the universities that need resolution. NIH is committed to working with all involved and to lending itself and its programs to sensible experiments. It intends to devote itself to this effort and perhaps to suggest possible alternatives and experiments for the Committee to consider at its fall meeting.

Respectfully submitted,

Joseph G. Perpich, M.D., J.D.
Executive Secretary

National Institutes of Health
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August 15, 1980

Attachments

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
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April 8, 1980

Dear

This follows up on our telephone conversation about your participation in the next meeting of the Advisory Committee to the Director, National Institutes of Health. The Committee will meet at the NIH for a full day on May 13 and a half day on May 14. See the enclosed agenda, with a list of Committee members and consultants (Attachment A).

At the meeting, the Committee will examine a series of cost and accountability issues that have become prime concerns of many of the Nation's research institutions. The contention is that as these issues continue to resist resolution both the institutions and the Government-university science relationship are jeopardized. The purpose of the meeting will be to pin down the nature of these problems and to begin to identify possible solutions. The review, which includes both university and Federal perspectives, is part of a larger effort to develop a strategy for stable support of health research.

At its meeting on December 4 and 5, the Advisory Committee to the Director, NIH, recommended an examination of the impact of grant stabilization on research institutions (see Attachment B for minutes). These matters were considered further at a meeting held on January 25, sponsored by the Association of American Medical Colleges (see Attachment C). Concern has been expressed by the universities regarding (1) declining Federal support in the face of steadily increasing costs at research institutions, (2) continuing differences on standards for indirect cost charges, (3) institutional needs for more flexible funding arrangements, (4) the impact of regulatory requirements on the costs of doing research, and (5) Federal auditing procedures.

The examination of health research costs at the forthcoming meeting of the Advisory Committee will focus on both the direct and indirect components of those costs. The agenda has been structured to permit consideration of NIH-supported research in public and private institutions. A unique feature of the program will be the presentations on the costs of doing health research from the perspectives of an investigator and an administrator from the same institution. (Enclosed are materials prepared by Dr. Richard Krause, Director, National Institute of Allergy and Infectious Diseases, which may serve as a model for presenting both investigators' and institutions' viewpoints--see Attachment D). In the afternoon, several Federal perspectives will be presented and discussed. These will include a review of cost principles for educational institutions as contained in OMB Circular A-21 (Attachment E).

The aim at this meeting is to achieve a better understanding of the real costs to the institution of doing research and to relate those costs to current Federal practices and procedures for cost accounting as set forth in OMB Circular A-21. Issues of particular concern include standards for indirect costs, time-and-effort reporting, and limitations on inter-grant cost transfers.

The second day will be devoted to a further exploration of fiscal accountability. A specific focus will be the report of the National Commission on Research, Accountability: Restoring the Quality of the Partnership (Attachment F). Members of the Commission will review the report and its recomendations. Many of the recommendations speak directly to the issues to be highlighted during the first day of the meeting. To conclude the discussion, NIH perspectives will be presented on the report and on issues raised in the course of the meeting.

I appreciate your willingness to participate in this meeting. I am hopeful that the effort we launch here will provide a strategy for HEW and NIH in addressing some of the vital concerns of research institutions and the Government.

If you have any questions about the proposed program or your role in it, please contact Dr. Joseph Perpich (301-496-3152), who serves as Executive Secretary of the Director's Advisory Committee. Dr. Perpich's secretary, Mrs. Elizabeth Shelton, will assist you in your travel and hotel arrangements.

Sincerely yours,

DS Fredrickson

Donald S. Fredrickson, M.D.
Director

6 Attachments:
- A - Agenda for DAC Meeting of May 13-14, 1980, with list of Committee members and consultants
- B - Minutes of DAC Meeting of December 4-5, 1979
- C - Minutes of the AAMC-Sponsored Meeting on Biomedical Research, January 25, 1980
- D - Illustrative Model for Examination of Costs
- E - OMB Ciruclar A-21 (March 6, 1979): Cost Principles for Educational Institutions
- F - Report of the National Commission on Research

April 24, 1980

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MEETING ON BIOMEDICAL RESEARCH
WITH THE DIRECTOR OF NIH

Sponsored by the
ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Minutes of the Meeting, January 25, 1980

Terry Sanford, President of Duke University, chaired the meeting. (See Attachment 1 for the agenda and list of participants.) Beginning with an overview, Mr. Sanford stated that there is a reciprocal interdependence between the health-research-intensive institutions and the National Institutes of Health and that, specifically, the academic health centers have a unique relation with NIH. However, over the past two decades, regulations and uncertainty of funding have raised doubts in the academic community about the future of biomedical research. There are a number of pressures for short-term gains, and there appears to be a lack of awareness, especially by the Government, of the research approaches at the institutions. NIH cannot solve the problems, he said, but it can provide leadership in the Government to meet them. The purpose of the meeting today was to identify major issues of concern to all the institutions and to select issues for possible future meetings.

Mr. Sanford then turned to the first major item on the agenda--institutional stabilization. This was to be discussed by Martin Meyerson, President of the University of Pennsylvania, and Dr. Julius Krevans, Dean, University of California School of Medicine at San Francisco.

I. INSTITUTIONAL STABILIZATION

Remarks by Mr. Meyerson

It has been observed, Mr. Meyerson said, that it is easier to move a cemetery than to change a university. That adage, however, certainly isn't true for describing the current situation, for the changes generally affecting the university, and specifically the health center, have been tremendous. There are many forces at play directly affecting the administration of the university and tending to destabilize the academic environment. He noted that OPEC actions, for example, have contributed to a rise in the energy budget for the University of Pennsylvania from $2 million to almost $20 million over the past decade.

There are a number of turf problems within universities, and especially with respect to the academic health centers. In his view, unless the university is sound, the academic health center suffers. He believes that a strong arts and sciences faculty program is necessary to create the best environment for the conduct of health research.

Mr. Meyerson then turned to the specific problems besetting the medical schools and the academic health centers. At the University of Pennsylvania, as Federal funds decrease for the health professional schools, there is more push for other sources of funding. Emphasis is on clinical practice, with less time and resources for clinical research and teaching.

Mr. Myerson noted a series of events that directly affected the programs of health professional schools. For example, the city administration in Philadelphia decided to close the city hospital, which had an adverse impact on the University's medical school. A former State commissioner of insurance instituted rules which reduced third-party payments for various teaching hospitals. In addition, State funds for the medical schools have not increased over most of the decade in the face of annual inflation.

Meanwhile, corporate funding continues to be directed to mission-oriented projects rather than to basic studies, and support from the major foundations to universities has been declining over the past years, with the research support, even there, largely directed to the applied.

Under such constraints, said Mr. Myerson, the universities look to NIH and the Federal Government generally for help. They rely on indirect costs from Federal grants and contracts. Some indirect cost levels are now up to 65 percent, and some investigators are urging the Federal Government to require the universities to lower them.

Mr. Meyerson said that the problems between universities and the Federal Government are primarily with agencies other than NIH. Out of a budget of $400 million for the University of Pennsylvania, approximately $4 million is spent to satisfy Federal paperwork requirements. He went on to note that the universities recognize that NIH must have a fair share of the Federal budgeting resources. Its special role with the universities and academic health centers requires that it have satisfactory budgets, as the universities are in desperate need of resources, especially for equipment, facilities, and renovation.

Mr. Meyerson observed that all these fiscal and accounting pressures have a strong tendency to create a research environment where no risks are taken and creativity is not enhanced. With the need for accountability, the researchers cannot afford failures. Thus, there is a growing loss of venturesomeness. Mr. Meyerson noted in conclusion that the Office of Naval Research in the '60s had a policy to fund research with great latitude so that risks could be taken and there could be a sense of venturesomeness and creativity in the research enterprise. It was essential to try to restore that environment.

Remarks by Dr. Krevans

Dr. Krevans opened by commenting on how successful the partnership of NIH and the medical schools has been over the past 25 years. There have been impressive research accomplishments, better medical school faculty, and an enhanced intellectual environment for research within the institutions. Increasingly over the past decade, however, the ability of the institution to make choices has been altered. More and more, the discretion concerning program funding and administration has been limited to meet the increasing fiscal, budgetary, and accounting constraints.

Dr. Krevans noted that during the period he has been Dean at San Francisco--from 1972 to 1979--funding from NIH has gone from approximately $17 million to $40 million (in constant dollars, to $27 million). The total budget has gone from $36 million to $100 million (in constant dollars, to $61 million). State funding has remained constant at approximately 25 percent of the total budget. In terms of the total budget, the Federal share has dropped from 48 percent to 41 percent over the past 7 years. The endowment income has doubled, but because of the increased budget it has in fact declined as a proportion of the total, from 3 to 2 percent. The only major increase has been in professional activities and services from the clinical department through third-party payers. The only discretionary funding from the Federal Government has been through the capitation and BRSG grants. In 1972 these discretionary sources of funding accounted for 3 percent of the budget, and in 1979 they accounted for 0.6 percent.

Dr. Krevans emphasized that the increasing regulations and rules regarding Federal grants and contracts have forced universities to spend more and more of their resources on financial management. The University has recently had to increase the number of auditing personnel from 17 to 53 to satisfy Federal requirements. And then, there is the enormous burgeoning of Federal rules and regulations to ensure public accountability, including the Institutional Biosafety Committees, the Institutional Review Boards, and the many rules of FDA, OSHA, and EPA.

Indeed, the medical schools and NIH share common problems in that both encounter increased costs to meet the standards. Moreover, there are a number of problems to be worked on--attracting young people into research, attracting physicians into research, and having discretionary resources to maintain research initiatives. Dr. Krevans believed today's meeting was an important beginning in addressing these common concerns.

Discussion by Participants

Mr. Sanford then asked for comments. Dr. Fredrickson asked Dr. Krevans whether, in speaking of Federal requirements and rules regarding grants and contracts, he meant the auditing of grants but not the peer review system. Dr. Krevans said that, indeed, he was referring to the fiscal controls and not the peer review system of NIH. In the present climate, he said, principal investigators feel that auditors look at them as if they were misusing Federal funds.

Mr. Meyerson said that these constraints not only diminish risk-taking but also block necessary revitalization of existing departments. Dr. Wallace Mann asked Mr. Meyerson to comment further on corporate support for universities, citing a recent Science magazine article that noted the opportunities for better university and private-sector linkage. Mr. Meyerson responded that it is harder in the present climate to get support for discretionary purposes. Basically, corporations that provide support are accountable to their boards, and they must report to their shareholders on how the money was spent and what payoffs, if any, were forthcoming.

Dr. Jules Lapidus emphasized the importance of maintaining research capability among a number of different investigators, disciplines, and institutions. He spoke favorably of the National Science Foundation's attempt to support equipment on the basis of regional use. A good deal of biomedical research, he suggested, is being done in departments of chemistry and physics and in agricultural schools, but there is much more opportunity here if the NIH would seize it.

Dr. John Cooper summarized the opening remarks of Mr. Meyerson and Dr. Krevans by noting that each separate Federal rule or regulation changes the university slightly, but that a multiplication of the rules has created assaults on the institutions, changing them significantly. He cited again the new rules and regulations regarding modernization of facilities to meet the needs of the handicapped, the changes in capitation, and the changes in faculty income, all of which have placed increasing stress on institutions and have led to instability. He suggested that an impact study be done each time a Federal rule is promulgated to determine what effect it will have on the university and especially on the health research environment. Finally, he noted that NIH should really monitor closely the actions of its sister agencies that affect the research environment and bring to their attention the deleterious impact of those actions.

Dr. Lattie Coor commented that the health center at the University of Vermont is small and not as well funded as many of the others represented at the meeting. However, the quality of the research there is high. Sixty percent of the graduates of the medical school go into primary care, yet the school is twelfth among academic medical centers for graduates going into academic medicine.

He noted that 15 percent of a budget of $20 million is provided by the State. The budget has doubled over the past 5 years, largely on the basis of income from clinical services. In addition, student tuition has tripled. The medical school has remained financially stable, but virtually all of its energy has gone to sustain rather than build the research capacity. Most of the effort goes into practice and teaching, with a retreat from research and risk-taking. Dr. Coor said he feared this trend will continue to accelerate unless there are definite changes by the Government.

Dr. Fredrickson asked Dr. Coor what the level of NIH support was at the medical school. Although he did not know the exact figure, Dr. Coor estimated that $9 million of the $20 million budget came from the Federal Government. (Dr. Carl Douglass of DRG determined that the NIH contribution was $7.8 million.)

Dr. Louis Sullivan indicated that his school, Morehouse College of Medicine, was a new minority school whose main emphasis was on primary care. He and the faculty recognized that for the school to be of the highest quality, there must be a strong research commitment. He, too, noted the lack of venturesomeness. For a new institution with diminishing resources, he said, there is an even greater pressure to do the predictable in research. Increasing amounts of time are spent in meeting administrative and regulatory requirements and in trying to raise funds. Dr. Fredrickson asked whether Congress has been informed of this recognition at minority institutions that the quality of education is linked to the quality of research. Dr. Sullivan responded that he doesn't believe Congress has been made generally aware of it and that, of course, he and others must try to get that message across.

Dr. Krevans remarked that it was difficult to speak to the Congress and others about the essential connection between research and education because it may seem self-serving. He finds that there is often an attitude that the priorities of educational institutions are distorted and not related to social needs--that somehow research goals can conflict with humane and social concerns. In response, Dr. Mahlon Hoagland commented on how perceptions of the public and the Congress might be changed. More must be done to work effectively with the Congress, and he noted that over the past 3 years, he and a number of his colleagues have done much to inform congressional committees, and specifically appropriations committees, of a need for broad support for fundamental research, and that Congress has responded to this effort.

Mr. Sanford then concluded the discussion, turning to the next item on the agenda--accountability and federally funded research. He called on Drs. Christopher Fordham and Robert Petersdorf for their remarks.

II. ACCOUNTABILITY AND FEDERALLY FUNDED RESEARCH

Remarks of Dr. Fordham

Emphasizing that this is a particularly troubled time, especially with limited resources for education and research both at the national and institutional levels, Dr. Fordham felt that one must still strive to find approaches that permit both the setting of priorities and the venturesomeness essential for creative research. He affirmed previous observations that more and more of the resources of the institution are going for financial accounting, with serious consequences for all concerned. In fact, he discerns a trend where financial requirements will drive programs, and program people will have less and less to say about administration. In Dr. Fordham's view, there must be recognition of the importance of balance between program needs and financial accountability.

Dr. Fordham believes a credibility gap exists between the Federal Government and the universities on the subject of financial accountability. The Federal perception seems to be that faculty are reluctant to give the necessary data for auditing, while principal investigators and university administrators see the Federal Government as less and less interested in the scientist's need to do good research, requiring that attention be increasingly diverted to paperwork.

Dr. Fordham then went on to discuss the broad areas of financial and scientific accountability. As to the former, he said, the institutions over the past 10 years have gained expertise and, in his view, now run programs efficiently with good fiscal monitoring. Scientific accountability is afforded through the peer review system. The major problem lies in the approach of the Federal Government to financial accountability--namely, the requirements for time-and-effort reporting.

Dr. Fordham said there is no acceptable methodology at present for financial accounting of the research programs. He pointed out again the dilemma in using the time-and-effort approach to measure the time spent by the clinical faculty on research. The typical example in the academic health center, he said, is for a faculty member and students to see a patient and, in their hour together, to get in some teaching and research. It is increasingly apparent that the separation of research, education, and service functions through the time-and-effort reporting system is simply not workable. Yet the Federal Government asks for the data and the university administration must provide it. Some of the faculty members do so and others refuse. A credibility gap develops, and Federal auditors believe the principal investigator is trying to subvert the system and withhold data. The time-and-effort method, in Dr. Fordham's view, is simply counterproductive. It diminishes the credibility of the system and especially undermines clinical research. He felt that we must provide other mechanisms. As alternatives, he suggested examining the scientific output of the principal investigator and calling for interim reports on scientific progress.

Remarks by Dr. Robert Petersdorf

Dr. Peterdorf addressed the problems that the academic health centers and, specifically, the teaching hospitals face in meeting their responsibilities. He spoke of his personal experience as the head of a hospital complex in Boston. There are 32 different functions of the hospital, he said, that are under rules, regulations, or guidelines of 16 organizations in the State and Federal Governments and in private organizations. Within the State, one must meet, for example, the requirements for health manpower and certification of need. There are utilization review requirements and the monitoring of hospital costs for Blue Cross and Blue Shield. There are standards to be met for rate-setting through Medicaid and other State department. There are employee rights, safety standards, and rules governing abortions. At the Federal level the requirements are staggering: Hill-Burton, PSRO, the National Health Planning and Development Act, the Social Security Administration, Medicare and Medicaid, and regulations of FDA, EPA, and OSHA.

Dr. Petersdorf went on to cite a number of problems he had encountered in trying to construct a new building and to merge three hospitals. One must get approval from such organizations as the Department of Public Health and the Redevelopment Authority, and observe a host of rules and regulations set by the NLRB, EPA, Rate-Setting Commission, and the like. He concluded by noting that teaching hospitals, where the bulk of clinical research is done, exist in a regulatory climate, and it is becoming increasingly difficult to conduct research there.

Discussion by Participants

Dr. Charles Womer urged NIH to concern itself with the regulatory activities of the other agencies within HEW, and indeed of the Federal Government. He noted, for example, the Public Health Service's proposed regulations requiring research institutions to compensate injured research subjects. The universities wouldn't be able to get insurance, and as their lawyers have pointed out, they cannot assume uninsurable risks. Hence, the institution must either move to do clinical research at a Federal hospital or discontinue it altogether. It is essential that NIH promote understanding of the impact of these regulations on the universities. Dr. Fredrickson, in response, reported that the new Presidential Commission headed by Mr. Morris Abrams has agreed to consider this general subject and that Public Health Service regulations will therefore not be promulgated at present.

Dr. George Fraenkel felt that the impact of time-and-effort accounting on the universities will be to drive a wedge between research and education and service. Research will move out of the universities into the purely research organizations, such as NIH or other laboratories in the private sector. It is essential that we try to measure the product rather than the process of research. If present trends continue, the process will be excellent and the product terrible. In his view, time-and-effort reporting might well become a requirement for all university faculty if the university receives any Federal funding (analogous to the present requirements for the Institutional Review Boards). The impact, he believes, would be enormous and severe.

Dr. Fredrickson commented that the time-and-effort approach and requirements have arisen from a number of sources. For example, the organization of NIH into several categorical Institutes requires multiple accounting for diverse grants. Again, the support through project grants and the Congressional demands of the past in separating NIH support from research and education--all have produced tensions leading to time-and-effort reporting. Accordingly, Dr. Fredrickson said, we can't merely change a few rules and procedures. We must review the whole system for the origins of the problems--and they are real problems.

Dr. Lapidus noted that it seems to be easier, at present, to talk to the OMB about university problems than to HEW.

Mr. Meyerson asked Dr. Fredrickson how he accounts for the balance to be struck under the different mechanisms of support by NIH and the several research missions. He said that 40 percent of the national support for research is now targeted, as opposed to 20 percent in the 1960s. Dr. Frederickson reported that NIH over the past 3 years has developed a planning process involving program reviews each fall with the several Institutes, in preparation for the President's Budget and the appropriations hearings for succeeding fiscal years. This fall, for the first time, the reviews included Advisory Council members, to get as broad a participation as possible in setting missions for NIH and the emphases for support.

In addition to the NIH planning, there has been under way an HEW health research planning process begun early in 1978 under former Secretary Califano. Its aims were to examine the research capabilities in support of all health missions of the Department, to recommend any necessary modifications, and to reaffirm the Federal commitment to support of the health sciences. A National Conference on Health Research Principles was held in October 1978, and final principles based on this Conference were released last August.

These speak to a need for continuing and predictable support of knowledge-development activities in fundamental areas, and for sustaining and enhancing current research capabilities. An HEW health research planning document, strongly influenced by the principles, was subsequently developed. It provides an analysis of all current health research activities in the Department, plus a set of proposed health research initiatives for 1980 and beyond. This document is now awaiting the Secretary's action.

A key health research initiative in the HEW plan concerns stabilization of that element within "the science base" that relates to NIH and ADAMHA support for investigator-initiated research project grants. The initiative to ensure stable funding of such grants has become the centerpiece in NIH plans for fiscal year 1981 and the period 1982-84, with projections for other program components tied to this initiative.

Dr. Fredrickson concluded by remarking that current planning is largely on the margin of the budget commitments. Planning has focused generally on the distribution of research funds, on how we can use additional funds, and on what can be expected in the future. He noted that the chances for success in changing the modalities of support are there. We are not locked into a mold and can change if changes can be justified.

Dr. Thomas Bartlett perceived that the process of accounting presently in place is leading to a reorganization of the universities and their systems. That is, the process is becoming the product, and increasingly the auditors are having the final say over program people on work in progress. There must be a reordering of the balance. Dr. Fredrickson responded that we need to address these concerns in a forum for all to hear and one in which all viewpoints can be expressed.

Dr. Lapidus noted that when a new program officer turns to the financial officer to ask "How do I do this?" the financial officer often interprets the question as "Can I do it?" and the answer is increasingly "No."

Dr. Krevans commented that NIH is not the cause of the problem; indeed, it has problems in common with the universities. What is needed is for NIH to be a spokesman for these common problems. In the past, this has been a difficult role for NIH, but it should speak out, for its credibility is high. Conversely, Dr. Krevans noted that the universities need to talk with NIH about its problems and how they can be helpful. The university representatives would be more creditable spokesmen for the intramural programs.

Dr. Fredrickson responded that he had come to this meeting to listen and not to defend NIH specifically or Federal policies generally. There are many forces, he said, that have had a deleterious influence on the direction of the institutions. Much of the instability arose in the '60s, but since then things have been settling down and the credibility of research in the universities has grown. People do believe that the universities and the research community are not isolated from society's problems, that they do care, and also that NIH has been better able to define its boundaries. NIH at present must look at the way it is organized and at how it impacts on universities through that organization. The effort should be more collective, rather than being derived from the actions of individual categorical institutes. In order to assist the universities, NIH has probably gone as far as it can in the categorical approach, and it may need broader mechanisms for support. From Dr. Fredrickson's perspective, the research plan at NIH over the past 3 years and the HEW research planning effort are extremely useful in providing a broad spectrum of health sciences support within the Department.

Dr. Fredrickson believed the NIH can have impact on Federal research policy and that the relation of the biomedical research community to Federal policy-makers is not as unstable as it was in the past with Congress and the Executive Branch. However, NIH and the universities, to deal effectively with government and the Congress, must understand what they want to change and why. We need to understand our institutions better because we are linked in a common destiny. NIH funds have had a major effect on research and the organization of universities. The survival of the universities is crucial to that of NIH and its mission. We must begin to look at our problems, and especially at responsibilities in research and education, as we consider the new Department of Education and its forthcoming relationship with universities, HEW, and the educational system in general.

Mr. Sanford then passed to the third agenda item, assigned to Drs. Robert Bock and Daniel Tosteson.

III. RESEARCH FUNDING

Remarks by Dr. Robert Bock

Dr. Bock opened by lauding the efforts of Dr. Fredrickson over the past 3 or 4 years to stabilize support of research project grants (traditional research projects and program projects). He recognized that this effort should limit or constrain support for the rest of the NIH programs, and he expressed special concern for the adverse impact on the NIH intramural program. He noted that the universities must acknowledge the intramural program as a vital link with their research activities, and must actively support its stabilization.

He also endorsed the extension of grants support to 3 to 5 years and praised the peer review system as the best approach for maintaining scientific excellence. He recognized the importance of maintaining the quality of review of the NIH programs while ensuring public participation and attention to social needs. He suggested that, in the peer review system, mechanisms for review and appeal be considered and that attempts be made to simplify the paperwork.

Dr. Bock went on to say that NIH, as other speakers had noted, shares common problems with universities, especially in the area of increased fiscal accountability and regulations. He cited the animal care standards as following an excellent process for achieving agreement between NIH and the universities, and he noted that the DNA guidelines and their evolution have been a model for matching regulations with potential risks. Finally, he stated that priorities must be set at all universities. The capital fund drive at the University of Wisconsin, for example, is about to begin, and their priorities for the drive are set as follows: 40 percent of the funds would be targeted to equip the university hospital; 30 percent would go to the maintenance and construction of physical education facilities; 15 percent, to faculty support; and 15 percent, to student support. Increasingly, priorities will have to set at the local and national levels.

Remarks by Dr. Tosteson

Citing the unique role NIH plays in its support of the academic health centers, Dr. Tosteson pointed out that it provides most of the direction and has traditionally been the largest supporter for research at the medical schools. Even so, the research environment at the medical schools is deteriorating. The physical plant has not been maintained, much less renovated. The equipment is falling behind the state-of-the-art, and there are increasing bureaucratic and administrative burdens at the institutional and NIH levels, making research harder to do. Dr. Tosteson, in agreement with Dean Fraenkel, commented that these burdens are increasingly driving a wedge between the research, education, and service functions of the health professional schools. An outcome to be expected is that the preferred place to do research will shift from the universities to other research facilities, such as the intramural programs of NIH.

Dr. Tosteson said that funding for biomedical research has not kept pace with inflation, much less with the need to exploit promising areas of science. He noted that the NIH budget has been relatively flat for the past decade and that expenditures for health R&D as a percentage of total health costs have been declining. Dr. Tosteson suggested that we consider adopting a target index for R&D as a percent of the Nation's total health effort. The research institutions and NIH should make the point that research cannot thrive at 3.3 percent of the total health expenditure in this country. In the private sector the target of research to other costs is in the range of 6-10 percent.

Managing funds at the university in the context of diminishing support and rising costs and burdens is more critical with each passing year. The subject of "direct versus indirect costs" is one the institutions must tackle, especially as the principal investigator in many instances doesn't understand what those costs are for. Dr. Tosteson pointed out that a large part is for energy. Harvard Medical School's energy budget will rise $3 million in the next fiscal year, and that can only be recovered largely from indirect costs. Thus, the question of indirect costs must be met squarely in the attempt to stabilize the research environment.

A major institutional problem in the management of funds is dealing with the government auditors on expenditures. The Government's requirements for direct and indirect costs are leading more and more to the universities having to pick up the indirect costs of faculty salary support. Currently, Harvard Medical School faces $5 million in reimbursements from HEW on the basis of an audit. For example, a new OMB Circular A-21 will require that any unreimbursed faculty costs by the university will result in a reduction of its indirect cost recovery from the Government. More realistic approaches must be taken. NIH and its Study Sections must be fully aware that, given these circumstance, they should not be disapproving the salaries of principal investigators on grants. Perhaps one could try the approach of negotiation. The Study Section might assess the research record of a senior investigator to whom the university has a long-standing commitment for support, and funds could be awarded for 3 to 5 years with annual review. Salaries could be removed from the direct cost of grants, and there would be no need then for Study Sections to review salaries as part of the application.

Dr. Tosteson concluded that a key issue to be addressed is the treatment of salaries--how investigators can be supported without enormous review and paperwork to account for their time. He seconded the comments made on this account by Drs. Fordham and Fraenkel.

Discussion by Participants

Dr. Wallace Mann commented that many of the problems of the medical schools are also faced by the dental schools. He pointed out that there are approximately 60 dental schools in the country, that dental services cost $17 billion in 1979 and will cost approximately $20 billion in 1980. He noted that, despite the magnitude of the problem, the interest in the support of dental research in the past has not been as great as that for biomedical research. He believed that the dental and medical schools share common problems and that there must be a combined effort in meeting them. Dr. Fredrickson responded that he is very sensitive to the fact that the National Institute of Dental Research is virtually the sole supporter for dental research in the country, whereas other major health problems have multiple sources of funding.

Dr. Fredrickson also commented that NIH is very sensitive to regulations and their impact upon the institutions. He cited the recombinant DNA guidelines as an example of how NIH has tried to devise safety standards reflecting the most current scientific knowledge. He mentioned that the Secretary has approved revisions in the NIH Guidelines permitting more work to go forward with monitoring at the local rather than national level for several classes of experiments. NIH, he said, is also carefully following regulations proposed by other agencies to determine their potential impact upon the research environment.

Dr. Fredrickson also said that NIH will be considering other mechanisms for institutional support. The meeting today initiated that effort. He cited a recent report of the Association of American Universities (in response to an article on university accountability in *Business Week*) as concluding that "nearly all scientific research in a single university department is a related whole. The whole is broken into separate parts as a device to fit peer review evaluation of Federal projects." Dr. Fredrickson remarked that this is an ideal not yet attained; indeed, science cannot be a completely planned and integrated activity. Scientific research is compartmentalized and the peer review system reflects this, but perhaps one might consider how to make biomedical research into a broader and more integrated whole.

Dr. Tosteson stated that the message being given today by the university representatives is not that the institutions lack zeal or ideas, but that Federal investment in the past has enhanced medical education and research, with impressive payoffs. Now, however, there are a number of troubling signs that the system is in need of repair and that a new compact is called for between the institutions and the Government.

Mr. Meyerson pointed out that declining Federal support has placed great constraint on the salaries of researchers. Meanwhile inflation has continued to eat away at the income base much more for those in higher education than in other professions, such as law or medicine. Indeed, universities can no longer recruit researchers from several European countries, as they are better paid there and have better opportunities--a reversal from the preceding decade. Mr. Meyerson concluded to the effect that there is need for a new compact between the nonprofit research-intensive institutions and the Federal research agencies, based on a few principles and procedures to assure a new social contract with some promise of stability and growth. He hoped that NIH would take the lead in this for the Federal Government.

Topics for Future Discussion

After lunch, Mr. Sanford called for a discussion of topics for possible future meetings. The proposed topics include the following:

- Both initial and continuing support for institutionally oriented major research facilities (feasibility of regionalization),
- Funding for replacement of common laboratory instruments,
- Problems related to the determination of indirect costs and their reimbursement,
- Regulation of research, and
- Impact of the new Department of Education.

Dr. Fraenkel suggested that an additional topic may be the personnel crisis now facing the universities with the breakdown in education for the sciences. More attention must be paid to undergraduate education. Perhaps there is a need to look at the whole picture, and here the Department of Education might be helpful. Dr. Fredrickson asked whether Dr. Fraenkel had in mind the training of students in sciences. Dr. Fraenkel said that training of the undergraduate is the principal concern, as for example the typical pre-med. Dr. Fredrickson responded that there are a number of concerns here--that, for example, students with high scores on the MCAT have been showing a low interest in research during their medical training. Dr. Sullivan noted that another topic in this regard would be the training and supply of medical investigators.

Dr. Krevans called for a reexamination by the Government and local institutions of the general topic of regulations. He urged that a new compact be considered that would give more responsibility at the local level than at the Federal (much like the case of recombinant DNA research). He suggested that the third topic on the agenda cited above might be changed to "Problems Related to the Research Funding System."

IV. CONCLUDING COMMENTS

Remarks by Mr. Sanford

Mr. Sanford then briefly summarized the meeting. He thought it had been extremely useful in highlighting a number of the issues of mutual concern to universities and the Federal Government, and he said we must continue this examination. Further, the Federal Government must recognize that it is the institutions that have kept the United States foremost in research, and that we must strive to maintain that leadership. The question of how to maintain the institutions on which the Government relies will require a great deal more consideration and thought. We need to educate the Congress, the Government, and especially the OMB on the needs of the institutions, and on the importance of enhancing the research environment in order to keep the sense of venturesomeness and risk-taking for creative ideas. The institutions depend on the Federal Government and must especially have NIH support. There must be accountability, but with some sense of the problems created by government rules and regulations. Finally, he observed that, despite all the problems, there is a prevalent air of optimism, for the problems can be attacked jointly to keep the remarkable research system going in the United States.

Remarks by Dr. Fredrickson

Dr. Fredrickson noted that the purpose of the meeting was to improve our understanding of the problems of research-intensive institutions so that they and NIH can most usefully cooperate in maintaining an optimal environment for biomedical and behavioral research.

In a period of level Federal budgets and high inflation, widespread concerns are being generated by the evident difficulty of maintaining and enhancing present research capabilities. As part of its response to these concerns, NIH--a complex agency whose diverse components provide multiple funding to many organizations--has given special attention to the impact of its missions and monies, not only upon the beneficiaries of new scientific knowledge but also upon the institutions where the knowledge is generated. These latter effects are not limited to the well-known enhancement by research of the quality of instruction in academic institutions. The several billions of dollars expended by NIH in universities and hospitals each year determine much about the services, facilities, and amenities they can offer.

Dr. Fredrickson said that NIH had three main objectives with respect to this meeting:

- To signal to the research community that it is trying to understand and help overcome the forces threatening to destabilize research-intensive institutions;

- To clarify and pin down the nature of the key problems to be addressed; and

- To develop, or at least experiment with, solutions to those problems.

Dr. Fredrickson said that over the past 5 years he, as Director, has been considering with the NIH Institute Directors and staff the problems of characterizing the NIH mission in a way that would be understandable to grantees and contractors, to the Congress, and to the American public. As a result of the planning session, we can now display total NIH support in four main categories under the acronym "SATT." The largest of these (75-80 percent in FY 1980) promotes fundamental inquiry--either laboratory or clinical research--whose outcome is not immediately but may become applicable to health practice. This support of the Science Base is itself distributed in four main ways: (1) research grants for investigator-initiated projects (some 15,000 grants totaling about $1.5 billion), (2) categorical centers for research (another $292 million), (3) NIH intramural research ($342 million), and (4) other extramural support mechanisms, including but not limited to general clinical research centers, biomedical research support grants, and special instrumental and animal resources (for a total of about $541 million). The second major category is Applications, including developmental contracts, clinical trials, testing in the National Toxicology Program, and other similar extensions of the fundamental to the practical ($416 million). The third is Transfer ("technology assessment and transfer," totaling $177 million) which goes to major programs of the National Library of Medicine, to demonstrations and control experiments, and to such other activities as the NIH "consensus development" conferences. The fourth category is Training ($187 million), for which about 5 percent of all NIH monies are allocated.

Dr. Fredrickson stated that he had asked Dr. Carl Douglass of the Division of Research Grants to provide a profile on the support for Duke University from NIH and other Federal agencies. He noted that of $41 million awarded to Duke last year by the Federal Government, $36 million came from NIH. Of that amount, 60 percent was for the support of traditional research grants and program project grants. This emphasis on investigator-initiated awards for fundamental science is consistent with the policy to stabilize the research environment at the institution.

The discussion today and the agenda set forth by the AAMC identify several important institutional concerns. Dr. Fredrickson mentioned the following:

- With respect to "research-intensive" institutions, the degree of usefulness of the various support mechanisms should be reconsidered from both program and institutional perspectives. What is the basis for institutional antagonism toward particular mechanisms?

- For this reexamination, what is the relevance to research efficiency of the predicted downward trends in enrollment and faculty renewal? of the upward movement in hours required for income-development or the provision of medical care and teaching services?

- What are the effects of changing patent policy? of consortial arrangements with profit-makers on research goals?

- What are the influences (such as the house staff programs, board requirements, and the very pace of science itself) that make today's high-MCAT medical students low in research interests?

- Within the Federal budget, the case for needed additional support for health research will have to be urged at a time when other research areas are receiving priority attention at Federal policy levels. There is clear interest on the part of the Administration in improving American technology in areas other than health--energy research, defense, and the the Nation's scientific and technological future.

- Within health research, there is a need for more emphasis on aggregate planning to balance the existing and still-desirable categorical approach to resource allocation. NIH has deepened its examination of the appropriate kinds of collective action by its Institutes and Divisions to support their common needs.

- There is need to examine the claim that recent NIH policies are "destroying the research system" by excessive paperwork, regulatory pressures, and the toughness of HEW auditors. Is there any truth to such assertions, and if so, what changes are desirable?

- Another long-standing concern to be dealt with is how best to ensure long-term support for the most productive scientists, including those of Nobel caliber. Options to be examined include research career awards and research grants for extended periods--say, 7 years.

Dr. Fredrickson expressed the need to address these problems over the next several months and to begin discussions with the participants and other agencies within the Government. Such discussions, he said, must be held in a public forum to get a complete and full airing of all viewpoints. There is need to consider issues raised on indirect vs. direct costs, on the accounting practices of the Government, and especially time-and-effort reporting. We need to consider mechanisms for flexible funding and the NIH support through the Division of Research Resources and other channels. Perhaps we need to examine the role of industry, both as performer and source of funds. And in the absence of support for facilities construction, we may need to consider the Medical Research Council model of the European countries, where the federal government provides laboratories and people at the institutions in a long-term commitment.

Dr. Fredrickson concluded by commenting that the meeting was extraordinarily useful. He would continue to work with the AAMC and institutional representatives at this meeting to stage some formal review through his

Advisory Committee to the Director, the public advisory group that has been instrumental in examining the HEW research planning and all of the health research issues (including the debate on the recombinant DNA guidelines).

Dr. Fredrickson thanked Mr. Sanford and the others for allowing him to hear their views. The meeting was concluded at 1:30 p.m.

Respectfully submitted,

Joseph G. Perpich, M.D., J.D.
Associate Director for
Program Planning and Evaluation

National Institutes of Health
Bethesda, Maryland 20205
March 18, 1980

Attachment C

ACCOUNTABILITY:

Restoring the Quality of the Partnership

National Commission on Research
March 1980

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Foreword

The National Commission on Research is a private, nonprofit organization established to examine the relationships between government agencies and universities involved in research and to develop specific recommendations for improvements. The Commission was founded in the latter half of 1978 by the American Council on Education, the American Council of Learned Societies, the Association of American Universities, the National Academy of Sciences, the National Association of State Universities and Land-Grant Colleges, and the Social Science Research Council. The Commission works independently of its founders to examine the process by which the federal government supports academic research and to propose changes designed to improve that process.

Funding has been obtained for Commission activities to pursue this task from the following organizations: Carnegie Corporation of New York, Exxon Education Foundation, Ford Foundation, The William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, and the National Science Foundation (Grant No. PRM-7903778 and CDP-7926386). Over four-fifths of the funding was made available by the five private agencies and approximately one-fifth from the public source. Any opinions, findings, conclusions, and recommendations expressed in this publication are the sole responsibility of the Commission and do not necessarily reflect the views of any of the aforementioned funding sources or founders.

This publication on accountability is the first in a series of documents to be developed by the Commission to analyze the process of government funding and university involvement in research and to make recommendations to all affected parties for improvements in the system. Subcommittees of the Commission are investigating each of the following issues:

(1) Accountability;
(2) Peer review and other selection processes;
(3) Alternative funding mechanisms;
(4) Industry/university/government relationships; and
(5) Development of research personnel.

Position papers on each topic will be published by the Commission.

The members of the Subcommittee on Accountability are Linda S. Wilson, Chairman; William D. Carey; Donald N. Langenberg; Irwin C. Lieb; Charles A. Mosher; and Raymond L. Orbach.

In addition to surveying the available literature, subcommittee members and staff meet with selected officials from business, government, and the universities. At monthly meetings, invited speakers present their views on pertinent aspects of the listed topics or on the broad purview of the Commission. The Commission has received testimony on four university campuses from faculty members and administrators, as well as written comments stemming from invitations to research universities and from an open letter in *Science* magazine. Liaison with numerous government agencies is maintained through telephone contacts, correspondence, and attendance at Commission meetings. Approximately one hundred fifty persons have given advice and information to assist the Commission in its study thus far. The Commission appreciates the efforts of all the participants in its deliberations and discussions. A description of these considerations and a partial list of individuals are contained in the Appendix.

The members of the Commission are listed inside the front cover. These individuals have backgrounds in education, business, and government. They have accepted appointments to serve on the Commission without compensation. During Commission deliberations, they reflect their own experience and not necessarily the viewpoints of their institutions or organizations.

Liaison persons have been designated to the Commission by the following government agencies: Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA); Department of Defense (DOD); Department of Energy (DOE); Department of Health, Education, and Welfare (DHEW); General Accounting Office (GAO); National Aeronautics and Space Administration (NASA); National Institutes of Health (NIH); National Science Foundation (NSF); Office of Management and Budget (OMB); and Office of Science and Technology Policy (OSTP).

In its series of publications, the Commission will review the key elements of the present state of federally supported university research, affirm what it believes to be good in this system, analyze problem areas, and provide suggestions for actions to alleviate these problems. The Commission recognizes that much diversity exists in the complex relationships among principal investigators, research administrators and others in the university community, and program officers, auditors, administrators, and other government personnel. There is a wide range of beneficiaries, including industry, students, and the general public. The goals of the participating government organizations and educational institutions and of the concerned individuals involved in federally supported research are diverse and sometimes overlapping but not identical. Therefore, the Commission does not anticipate the ability to establish consensus on all of the issues. The Commission does seek to make a contribution to improved research in our nation by improving a system which produces a major portion of that research.

NATIONAL COMMISSION ON RESEARCH
Accountability: Restoring the Quality of the Partnership

Executive Summary

For the better part of a half century, the Federal government and the research universities of the nation have been associated closely in the support and performance of research. Recently, this relationship has become strained. The partners have developed different views on the objectives of their association and the conditions of their collaboration.

The Commission

The National Commission on Research was formed in late 1978 as an independent body. It was sponsored by interested organizations and supported principally by private foundations. The Commission was charged to study the relationship between the government and the research universities, to determine the nature and origins of the problems afflicting the relationship, and to recommend ways to solve these problems. Additional information on the origins and purposes of the Commission is contained in the Foreword (p. ix).

Accountability

Many of the issues in dispute between the government and the research universities relate to increasing pressures for greater accountability for public resources. In this document, the Commission presents its view of the issues, states its conclusions, and suggests its recommendations concerning accountability in university research supported by the Federal government.

The Introduction (p. 1) asserts that this research is conducted in the public interest. It presents the viewpoint of the government and the universities on the accountability problems and issues. The section on purpose and scope (p. 5) provides definitions of accountability. Two principal types are discussed: scientific accountability, and financial and administrative accountability. The mechanisms currently used to attain these types are described. The nature and evidence section (p. 7) restates the accountability problems. The disagreement is expressed by opposing contentions. On the one hand, university research administrative practices are inadequate; on the other hand, government procedures do not fit university research. The nature of the problems is discussed in detail. This section concludes with a summary of the evidence gathered by the Commission.

Conclusions

The Commission derived several general conclusions from its study (p. 15).

First, there is no issue between the research universities and the government about the need for accountability for public resources expended in support of research. The issue is how that accountability is to be rendered.

Second, differences between the government and the universities over this issue have caused a deterioration of their relationship.

Third, the quality of the relationship must be restored on the basis of mutually understood and agreed upon principles and objectives.

Fourth, the universities must regulate themselves more effectively, and the government must reduce the detail and volume of its requirements so that the benefits exceed the costs of compliance.

Fifth, the universities and the government should seek agreement on a revised body of regulations. These revisions should produce a necessary and sufficient set of regulations which meet two standards: fully acceptable accountability and preservation of the research environment.

Finally, the management tools currently available to address these accountability problems are inadequate. New and alternative approaches are needed. Experiments to discover the best tools should be expanded and supported.

Principles and Objectives

The Commission states two sets of fundamental principles which it believes guide the actions of the government and the universities. Major improvements in their relationship are only possible if each recognizes and understands the principles of the other. Within the framework of these principles, a set of mutual objectives for the government-universities research relationship then are defined. The recommendations of the Commission are based on these principles and objectives.

Recommendations

An explanation of each recommendation is contained in the full report (p. 19). The recommendations focus on three areas. Recommendation 1 provides for better understanding of the system by all the participants. Recommendations 2 through 6 deal with tailoring the accountability requirements to the nature of the research activity. Recommendations 7 through 11 provide means to increase flexibility and maintain accountability.

The Accountability recommendations of the National Commission on Research are:

1. The Commission recommends that research universities and the government make vigorous, concerted efforts to overcome the mutual suspicions, ignorance, and misunderstandings which strain their relationship and weaken the nation's research enterprise.

2a. The Commission recommends that research universities and the government develop a new system for accountability tailored to the nature of the activity being sponsored and based on a set of minimum core requirements applicable to all research agreements. The core requirements would be sufficient for all basic research and for some applied research; further requirements would be added only for activities of a pronounced procurement character.

2b. The Commission recommends that the Office of Management and Budget, in consultation with the federal agencies which sponsor research and the universities, revise the federal cost principles (Circular A-21) and the federal management principles (Circular A-110) as soon as possible, but certainly within three to five years. The revision should assure that these guidelines for financial and administrative accountability (1) incorporate features which not only control against abuse but also facilitate and encourage effective management, (2) are fully consistent with the nature of the research process, (3) accommodate better to the academic environment in which they must operate, and (4) are based on better mutual understanding of the purposes of the government-university research relationship.

3a. The Commission recommends, as a minimum, that the Office of Management and Budget institute new procedures to allow an opportunity for research funding agencies to comment on draft audit findings covering their university projects. This arrangement would be roughly parallel with current practices involving draft GAO management audit reports, and would provide relevant information for the audit agency.

3b. In addition to the above review, the Commission recommends, as an optimum, that agency program officers supplement their review of final scientific reports with advisory observations concerning the reasonableness, from a research standpoint, of the expenditures for personnel. The records of sponsoring agencies subsequently would be useful for the independent financial audits. This would link the technical review and the financial audit, an important linkage now missing.

4. The Commission recommends a simpler and less costly method of effort reporting based on responsible self-regulation: the explicit certification by individual investigators that direct salary charges to their research agreements are reasonable and fair, coupled with the federal program officer's review of the reasonableness of these expenditures for the work undertaken.

5. The Commission recommends that government agencies and universities construct an option, analogous to the "standard deduction" in income tax calculation, to charge activity which is treated as indirect costs under sponsored agreements. The fixed percentage would be negotiated. It might either be uniform or vary from institution to institution. Some universities would not receive full credit for their allowable indirect costs. However, accountability would be fully served and both government and universities would reduce the burden of detailed accounting and audit.

6. The Commission recommends that university presidents review their financial management systems. Universities should invest sufficient resources to ensure adequate control and accounting for the expenditure of research funds. These systems must provide timely and accurate financial information necessary for effective research management by research investigators. In turn, research investigators must meet the responsibilities and obligations which accompany their use of public funds.

7. The Commission recommends that the government and universities develop revised financial and scientific accountability processes which increase the flexibility and incentives for investigators to manage research funds in a scientifically prudent manner.
8. The Commission recommends that agencies delegate to the universities more authority to make budgeting and management decisions under sponsored agreements.
9. The Commission recommends that Congress authorize and agencies develop arrangements for aggregating individual research projects for administrative purposes.
10. The Commission recommends that government agencies improve the management of research funds by eliminating unnecessary constraints on the timing of expenditures. Specifically, the Commission recommends institutional authorization for pre-award expenditures up to 90 days prior to the effective date of awards and for carry-over of surpluses or deficits to the following contractual period, at least up to a specified percentage of the total award for that period. This involves no risk or commitment by the sponsoring agency.
11. The Commission recommends that Congress, the agencies, and the universities assure that the processes of accountability themselves meet the tests of accountability. The processes should yield results which justify their cost. One important application of this principle would be the elimination of the documentation now required by legislated cost-sharing on research grants.

A Forum

In addition to the recommendations related to accountability, the Commission hopes to initiate an evolution toward improvement (p. 27). It offers a preliminary suggestion of means for continuing improvement of the government-university research relationship:

> The Commission suggests the establishment of a new and independent Forum, as an experiment for five years. The Forum should provide a non-adversarial setting for persons from the public, Congress, universities, and federal agencies to watch over the government-university relationship and guide its evolution.

This suggestion is offered to stimulate ideas and discussion.

Introduction

Research in the Public Interest

Research is performed by universities and supported by the Federal government because it is in the public interest to do so. The national research enterprise reflects a confluence of the purposes of the government and the research universities.

The purposes of the government and the universities overlap in the research enterprise, but the purposes of the two sides are not identical: the government and the universities each have other purposes which enhance the public interest. The government exists to assure public security and well-being. It pursues public policies principally through taxation, spending, and regulation. The universities exist to discover new knowledge and to preserve and disseminate knowledge through a triad of teaching, research, and service. These purposes also advance the public interest.

Research universities and the government share some important characteristics. Both are highly complex, evolving, and diverse institutions with limited resources and with some of their own goals in conflict. Both have limits to their success in achieving their purposes. Both have individuals in positions of leadership and responsibility who hold a wide variety of views on the proper relationship between the government and the universities. Both induce and respond to changing social expectations. These characteristics are typically American, sometimes immutable, and often more desirable than potential alternatives. Despite these similarities, there are deeply rooted institutional differences. These differences have been the major contributors to the disturbing deterioration of the government-university research relationship. Each partner in this research relationship is having difficulties with the actions and policies of the other. Attainment of the public interest in the conduct of research by universities with federal funds is deteriorating. The situation cannot be allowed to drift from bad to worse. The aim of the National Commission on Research is to propose actions and policies to reduce the difficulties which are damaging the research process.

The General Problem

A central issue in the government-university research relationship is accountability. Observers express the problem in widely varied terms. The following statements attempt to capture the main themes of the perspectives of the public, the government, and the research universities.

The problem for the *public* is to ensure that the best research is produced and that public funds are not wasted or abused. The problem for the *government* is to attain fully its program purposes and to fulfill its stewardship responsibilities. The problem for the *universities* is to conduct research well, to avoid diversion of resources to meet unnecessary administrative requirements, and to protect the integrity of their operations. Both the universities and the government seek to maintain public confidence, because support for their activities depends on it.

Specific Issues for the Government

Stewardship

Government officials have repeatedly stated that federal auditors are unable to review, to their standards and in a manner satisfactory to them, some university records for federal awards. They criticize both the accounting practices of universities and the management of federally supported research by university administrators and principal investigators. Many government leaders believe that in order to carry out their own stewardship responsibilities they must alter current university management and accounting practice.

Intervention

Critics have accused the Federal government of intruding excessively into university management and in some cases undermining their freedom and their capacity for effective pursuit of new knowledge. Opponents of this view state that the government actions being criticized are necessary for proper federal stewardship.

Resource Allocation

The government annually allocates public funds in the budget process to many competing uses. When a class of uses such as university research is criticized as lacking in accountability, it may suffer in this resource allocation. This is particularly true when general economic conditions extraneous to the program purpose create pressures for restrained spending. Research programs are always discretionary, and thus bear a disporportionate share of this pressure. In order to stretch funds further, everyone seeks to avoid fraud, abuse, and waste. The lack of expanding resources creates problems for the research advocates in the government, while it gives additional influence to opponents of expanded government support of research.

Diversion

Administrative practices under federal programs have been criticized on the basis that universities divert funds from targeted federal program purposes to support more general research or other university activities. While opinions in the Congress and the Executive Branch vary, the present dominant policy thrust is to emphasize specific program purpose (e.g., application of new energy technology or a new treatment of a disease) over more general purpose (e.g., basic physical characteristics of non-fossil fuels or molecular biology). This can create an inherent government bias against basic research and against programs of general support for universities. Some government leaders recognize the high value of public investment in both basic research and the general well-being of the university research community. This group includes President Carter and President Ford. With some success, these leaders fight an uphill battle for greater federal support for research.

Debate over general support versus specific application is likely to remain a permanent feature of the government-university research relationship. It results in some situations where federal support is offered on terms not fully acceptable to the universities. As in any negotiation, both parties seek to maintain their fundamental objectives. That is, the government seeks strict interpretation of the program purpose and its administrative rules, while the universities seek broad interpretation of the program purpose and flexible application of administrative rules. This fundamental incongruity of expectation creates problems for both sides and is compounded by the fact that expectations also vary within the government and within the universities. A broad interpretation of program purpose which may seem legitimate to some is called fraud or abuse or an audit exception by others. A narrow interpretation may seem to contradict the underlying basis for agreement, i.e., support of research. The government problem is to administer programs in light of these differences of view.

Public Confidence

This issue affects both the universities and the government. When the general public receives reports of alleged wrongdoing, support for university research activity is diminished. This diminution is manifest both specifically in calls for reduced spending in research programs and generally in an anti-government attitude which makes government objectives more difficult to attain.

Specific Issues for the Universities

Criticism for Poor Management

In recent years government auditors have repeatedly criticized the ways universities operate and account for federal research support. Practices once accepted are now rejected as inadequate. University officials and principal investigators are called bad managers or worse. Given the subjective judgment and long time horizon necessary to evaluate the outcome of research, evaluation often focuses on the easily quantifiable elements of the process, principally time and money. On the other hand, university researchers believe that they are correct to give strong emphasis to the outcome of research, albeit difficult to measure. They tend to evaluate their own performance as managers on the outcome. They are concerned when external reviewers seem to focus only on the so-called input and the processes and then conclude that the universities are poorly managed. They find some of the costing and management standards provided by the government to be distorting, disruptive, and unfocused. They are understandably reluctant to abandon their own practices in favor of other methods which do not have the same objectives.

Reduction of Research

Economic pressures cited above under *Resource Allocation* in combination with declining enrollment forecasts place university research in a difficult financial squeeze. This situation is further tightened by the increasing diversion of federal support and university resources to administrative tasks associated with accountability. A new payroll or accounting system consumes funds which otherwise could be used directly in the laboratory. Although the trend may now be reversing, the annual level of federal support for basic research has declined in real dollar terms for almost ten years. U.S. scientists are particularly concerned about increased investment and success of other nations in science. The period of American dominance in most of these high-technology fields is at an end. The liberal arts and humanities are experiencing a very difficult period of diminished resources and weaker employment prospects for graduates and faculty alike. Because research functions in the university environment like capital investment functions in an industrial setting, some alarmed university leaders foresee a generation of problems resulting from present levels of research spending.

While some of this could be altered by raising federal spending, a significant portion of the downward pressure on resources is due to increased administrative requirements. Principal investigators are drawn away from research into complex and time consuming managerial activities which they view as irrelevant to conducting sound research. Criticism of effectiveness of the administration of research tends to depress budgets for research. Attempts to improve administration divert funds and effort from direct research. This cycle feeds on itself.

Reduced Flexibility

Universities carry out teaching, research, and service as an integrated whole, not as separate functions. This underlies the university perspective on the government issue discussed above under *Diversion*. In the United States there is a strong current belief as well as long tradition that each function is done best through the integrated approach and that separation would diminish each and seriously damage the institution. Federal programs are usually designed to support only one of these functions, although the value of byproducts and the long-term investment requirements involved are often recognized. Federal officials striving to obtain the most and the best research with limited funds available want to avoid unintended support of anything else. Universities do not accept the auditors' view that any multi-product process can have an exact cost properly allocated to each of the products. Accuracy is considered elusive and prohibitively expensive. Many researchers believe that the flexibility vital to their creative role is reduced by government requirements for highly structured planning and accounting. They do not believe their loss of flexibility is justified by the value of the level of accuracy required. Such levels are seen by many university investigators and administrators as excessive, distorting, and purposeless.

The character of the project grant system of distributing government research support will be discussed at length in subsequent publications of the Commission. One principal characteristic of this system is that investigators often must package multiple sources of funds to support a coherent research program. Each source has its own rules and purposes. The investigator may grasp the distinctions among them, but his main focus is on the research itself. Some of these distinctions may seem arbitrary and unnecessary to the investigator.

The requirement to account separately for each award creates an artificial separation. Such segregation leads to cost transfers between projects. Cost transfers cause difficulties with audits. Making distinctions between research and teaching causes disagreements between universities and auditors over time and effort reporting. General requirements for advance planning of highly speculative research events and adherence of record keeping systems to an external and sometimes poorly suited accounting standard cause serious loss of flexibility for university researchers. Many observers believe that this represents a sizeable and unwise diversion of dollar resources and an erosive effect on the creativity vital to the research process.

Public Confidence

As stated above, both the government and the universities are affected if they lose public confidence. The problems for the university community are several. State institutions can lose state funds. Both state and private universities can lose private sources of funds. The quality and performance of the faculty and the students can be eroded. To flourish, university research needs the support and confidence of the public. These problems can diminish that support and thus weaken the research process.

Improvement of the Relationship

In October 1978, an independent National Commission on Research was created to study the government-university research relationship and to recommend ways to improve it. In its study on accountability, the Commission obtained the views of a wide range of government and university officials and reviewed many documents and studies. The gathering of new data or replication of previous investigation was beyond the Commission's resources. Instead the Commission used wide consultations and available materials to develop its views on accountability and to formulate principles and objectives which might serve as a framework for their resolution. Early in the study the Commission became convinced—and that conviction was reinforced throughout—that *there is no issue between the universities and the government about the need for accountability. The issue is how accountability is to be rendered.*

This report describes the purpose and scope of accountability, the mechanisms now used to provide it, the problems that have arisen concerning it, and the conclusions the Commission has drawn from its study. It states the fundamental principles deemed essential by the parties in the government-university relationship and sets forth objectives for the relationship which are consistent with these principles. Finally, the report presents recommendations of the Commission for ameliorating the problems in accountability.

Since the government's major funding for research is for work in the physical and life sciences, the report refers often to "scientists." The issues described, however, are equally troubling to humanists, engineers, and social scientists.

Purpose and Scope of Accountability

Accountability means being responsible and assuring that actions are taken and resources are managed with proper regard for the rights of others. Accountability can be achieved through systems of checks and balances, through independent reviews, and through structuring relationships so that consequences depend on certain norms of behavior.

In academic research, scientists and scholars are accountable not only to the governing bodies of their institutions, but also to their profession, which demands disclosure, proof, replication, and rigorous intellectual honesty. When public funds are involved in the support of research there is a further accountability required, not only on the part of those conducting the research, but also on the part of those responsible for the allocation of funds. Executive Branch officials must be able to justify to the Congress and to the general public the choice of research to be supported, the selection of the research performers, the quality of the research performed, and the propriety of the expenditures involved.

There are various forms of accountability: for *financial and administrative* accountability the focus is on evidence of financial propriety and regularity and compliance with administrative requirements; for *scientific* (or programmatic) accountability* the issue is achievement of results or progress toward proposed scientific objectives; for *social* accountability the issue is the extent to which specific social goals have been fulfilled in the performance of research.

The Commission worked principally on scientific accountability and financial and administrative accountability.

There are also different modes of accountability: in *performance* accountability the emphasis is on outcome; for *process* accountability the focus is on the procedures or methods used. Process accountability serves as a surrogate for performance accountability when outcome or progress is difficult to evaluate. Overall accountability is a mixture of these various aspects. When well designed, the system of accountability involves an appropriate balance between independence and control, between incentives and constraints, and between the costs and benefits of the various procedures and requirements used.

Mechanisms of Accountability

Scientific Accountability

Several mechanisms are used to provide accountability for research in universities. Researchers are accountable to themselves, to their peers, and to their universities. They also provide accounts of their work in their publications. The ethics of science is based on settled principles of disclosure, proof, and replication. Science, like other areas of scholarship, demands integrity. Deviation from these norms carries a heavy professional penalty. The peers of scientists and other scholars judge the soundness and value of their research results. Peers play a major role in deciding what science will be supported and thereby influence what kind of science will be done. They also participate in the selection of the research to be published in scholarly journals. The quantity and quality of research published by the faculty in research universities is a major factor in their recruitment, promotion, tenure, and continuing performance evaluation. These forms of peer and institutional accountability occur whether or not the research is supported by the government.

Researchers also render an accounting on the substance of their sponsored research to their sponsoring agencies by way of technical reports. Such reports may be incorporated in proposals for future support or may be provided separately. Proposals found wanting in the report of research accomplished with previous support fail in the competition for additional funding. In some areas the competition for support is so strong that many proposals of very high quality cannot be funded. For these areas the review of scientific accountability is especially severe. The nature of the technical report required and the care with which such reports are reviewed vary by sponsoring agency and also by type of research involved.

Scientists are also accountable, in general, to society at large. In some specific areas, scientists' accountability to the public takes place through public participation in review of research to be undertaken, as in lay membership on committees responsible for review of the use of human subjects and lay membership in governmental advisory councils.

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*Since most of the work sponsored by federal agencies at universities is in fields of science, the term "scientific accountability" will be used instead of "programmatic accountability."

Financial and Administrative Accountability

The goal of financial and administrative accountability is the assurance that funds are spent in accordance with the terms of the research agreement, without diversion, waste, or fraud. Some issues are: the bearing of the expenditures to the purpose of the award, management effectiveness, economy and efficiency, including the stewardship of resources, and the integrity of financial operations. Additional expectations are for fair and ethical practices, proper locus of control, compliance with applicable laws and regulations, prudent scientific management, and a reasonable and equitable apportionment of costs in joint activities.

Financial and administrative accountability is implemented through the expectations and requirements of the sponsor, incentives and information, checks and balances in the operating systems of both parties to a research agreement, and subsequent reviews of expenditures and operations. The expectations and requirements of the sponsor are set out in several ways. The parties have a general understanding of the scope and purpose of their association, and of the general rules which apply to all agreements of the kind that they have made. In the government-university partnership, these include the cost principles (OMB Circular A-21), the management standards (OMB Circular A-110), and, for contracts, the standard procurement regulations. Specific rules apply on an agency by agency basis as defined in the agency grants administration manual. Each agreement also may include specifically designed and unique terms and conditions.

For a university to provide financial and administrative accountability, all the concerned persons in a university must know the expectations and constraints of the research agreement. Research investigators must recognize the limitations specified and implied by their grants and contracts and must have accurate and timely information on the financial status of their project accounts. Institutions must have accounting systems which enable them to keep effective records of agreements which have different terms and contractual periods and which enable them to assign costs on a sound and logical basis. Their financial management systems must control access to funds and provide independent review of decisions in order to avoid conflicts of interest or temptations for illegitimate personal or institutional gain. Audits of these systems by independent public accountants or state officials must test the general financial integrity of transactions and reports. For restricted funds, they must test also for the institution's compliance with the intentions of their sponsors and donors.

Current federal policy provides for federal audits to review systematically or to appraise whether: financial operations are properly conducted and financial reports are presented fairly; applicable laws and regulations have been followed; resources are managed in an effective manner; and desired results and objectives are being achieved in an effective manner. Federal policy also stipulates that the scope of federal audits is to be tailored to each specific program, to the management need to be met, and to the capacity of audit facilities.

Financial and administrative accountability also can be fostered by arranging incentives for prudent and productive management and through developing guidelines and optimal information for management purposes. Effective accountability mechanisms should encourage and facilitate good management as well as control against abuse.

Nature and Evidence of Accountability Problems

Restatement of the Problem of Accountability

There is no disagreement over the need for accountability. The basic disagreement between the government and the universities over accountability is how accountability is to be rendered. This disagreement is expressed in two opposing contentions: on one hand, that university accounting systems are inadequate for stewardship of public funds and, on the other, that government procedures do not appropriately allow for the conditions required to discover new knowledge or for the multi-product nature of the activities in research universities.

The Context of the Problem

These concerns arise in the context of the life cycle of research agreements which has three primary stages: (1) the selection of research to be supported, (2) the conduct of the research, and (3) the reporting of research results and accounting for resources. Different facets of accountability and different participants are involved in each of these stages. The operating understandings and procedures of one stage do not always interact constructively with those of another stage.

For example, detailed research proposals which may be useful in choosing among projects which all meet a high standard can become a straitjacket if followed strictly in the conduct of science. The project grant system funds individual projects rather than broad programs of research. This enhances the selection of research to be supported but complicates its administration and can impede the coordination of closely related lines of inquiry. This narrow compartmentalization of federally supported research is inconsistent with research practice. The normal activities of the university investigator integrate research, teaching, and service; and these activities often intertwine multiple research projects.

Major Areas of Concern

The major areas of contention are (1) the use of federal funds for intended purposes, (2) the nature and extent of documentation necessary to validate expenditures, and (3) the systems and controls required for management of resources.

Recent government audits of federal grants and contracts at colleges and universities repeatedly have cited documentation practices which the auditors find inadequate to verify the charges. Particular focus has centered on the dissatisfaction of the auditors with the system to document charges for salaries and wages, the "effort reporting problem." Other problems have involved inadequate documentation of cost sharing, undocumented consultant costs, and improper and undocumented cost transfers. The auditors have found deficiencies in some university management systems, such as those for cash management and for acquisition, control, and accountability for equipment and supplies. Improper charges are cited less frequently but include overcharges of fringe benefits, summer salaries charged at a rate in excess of a prescribed base, tax-exempt stipends charged as salaries, and improper cost transfers.

Government officials also contend that institutions are inordinately slow in making changes in their financial management systems to comply with changed standards set by the government.

Some government officials and auditors contend that investigators and institutions have allowed diversion of federal funds from one project to another or to unsponsored institutional activities. Recently, two individuals have charged that institutions have used grant monies to pay for salaries and other costs unrelated to the purpose of the grants. From time to time, cases of fraud have emerged.

In 1979 the DHEW Office of the Inspector General issued its annual report[1] based on DHEW audits of $1.5 billion in grants and contracts with educational institutions. As a result of deficiencies cited by the auditors in these universities' systems of accounting, the auditors were unable to determine to their satisfaction whether $86.5 million, or approximately 5.7 percent of the expenditures reviewed, had been properly charged. The Inspector General's report pointed out that this did *not* mean that these expenditures were illegal or improper, but simply that they could not be audited under existing regulations and thus must be adjudicated. In addition, about $3.5 million in expenditures, approximately 0.23 percent of the total reviewed, were reported as not properly charged. Most of these problems were caused by deficiencies in the institutions' salary and wage documentation systems or were the result of inadequately supported or improper cost transfers.

Two recent GAO reports [2,3] based on examination of a sample of institutions, state that college and university accounting systems are inadequate for verification of the allowability of costs charged to federal grants and contracts.

It should be noted that the DHEW Inspector General report describes audit findings presented in DHEW audit reports. Such findings are not necessarily sustained through the subsequent steps of institutional response and resolution of any remaining differences. However, it is the Commission's view that even if the institutions' positions were sustained in a significant proportion of the cases, the fact that $86.5 million were deemed to be unauditable indicates a very serious lack of agreement about appropriate documentation standards.

The universities contend that cases of fraud and cases where government funds have been used to support unfunded activities are rare. They agree that such practice is improper and cannot be condoned. Fraud evokes stern instutitional sanctions. The universities believe that by and large the systems used by higher education do provide reasonable assurance that federal funds are used as intended, especially given the fact that a major research university typically has more than a thousand different government projects, each represented by a separate grant or contract to which costs are assigned. The universities are worried about what they perceive to be increasing emphasis on fiscal and administrative accountability without due regard for the scientific accountability provided in peer reviews, program reviews, and technical reports.

The universities point to an escalation in the documentation standards imposed by auditors without following regular processes for negotiation and promulgation of new standards. They contend that there has been retroactive application of new standards. The universities disagree with the escalation of documentation requirements and the all too frequent implication that lack of detailed documentation is evidence of abuse. The universities warn that some of the documentation and management standards can be incompatible and even counterproductive. This is particularly true if the standards are applied in an inflexible and heavy-handed way in the context of research in an academic environment. In addition, the universities have noted a marked inconsistency between the strictness of the auditors' expectation and the flexibility of management accepted and encouraged by government program officers who are focused on increasing the effectiveness of the federally supported research.

The universities chafe at what they believe is overemphasis on accounting precision, uniformity, and unrealistic expectations about the validity of certain accountability procedures, notably effort reporting. They are concerned about the continuing lack of recognition or reimbursement of certain kinds of research costs borne by them. They also question the validity and fairness of certain audit practices, for example, certain sampling procedures, and have some doubt about the integrity of the audit resolution process.

Individual investigators, program officers, and congressmen have voiced concerns about rising indirect costs, while universities lament the spiraling energy costs and escalating administrative requirements which cause increases in indirect costs.

The numerous concerns identified above contribute to rising tensions and threaten a relationship which for many years has been fruitful beyond measure. Through the government-university research collaboration knowledge has grown, research results have been widely and usefully applied, and both the government and the universities have been able to serve society better than either could have done on its own.

In his Science and Technology Message to Congress of March 1979,[4] President Jimmy Carter expressed his concern for the partnership between the Federal government and universities:

> The partnership . . . needs renewed attention. Many leaders of university research centers believe the government has intervened too deeply in university affairs, to the point of affecting institutional independence and diversity. The problem stems from the need to ensure accountability of research funds. On the one hand, accountability is important to me, to Congress, and to the taxpayers; we must improve the government's ability to manage and account for public funds. On the other hand, it is equally important that the pendulum not swing so far that we stifle progress. We must allow flexibility both for the government agencies and for the research institutions. We should not confuse excess paperwork with proper accountability. . . . It is clear . . . that our partnership with universities needs further strengthening. We must continue to experiment with new approaches.

Shortly afterwards, the Comptroller General of the United States acknowledged the strains in the government-university partnership and suggested that steps be taken to ease them.[5] Comptroller General Staats emphasized the need for strong accountability but acknowledged that precise, uniformly categorized accounting systems may not be appropriate for university research. He defined the key issue as how to assure appropriate stewardship for funds spent in support of research, without imposing excessive controls, direction, and administrative burden on research grantees.

The National Commission on Research has tried to explore carefully the various views of government and university participants and to develop a fair and objective assessment of the problems. Unfortunately, some of the reporting of the problems in the popular media has presented information out of context and without balance. The result of imbalanced reporting on this matter can be dangerous, since in effect such reporting is an attack on research scientists and the universities. Unnecessarily undermining the public's confidence in research and research institutions complicates the government's carrying out of national research support policies and will ultimately damage the public welfare.

In the following section the Commission reports on the origin of the accountability problems. Without appreciation of the factors which lead to the problems, workable solutions cannot be developed. Nor can responsibility be fairly assigned.

Origins of the Problem

Historical Developments

A number of significant changes have affected the evolution of the government-university relationship and contributed directly and indirectly to the development of the present problems over accountability. The character of the relationship itself has changed over the last forty years. In the early years relatively few researchers applied for federal support and few agencies and institutions were involved; the range of research topics was limited, and the community of researchers was small. Major researchers were often well known to each other and to the agencies. Proposals and budgets were not extensively detailed. In any one institution the number of externally supported research agreements was quite small. Administrative requirements were few and simple.

In contrast, there are now over one hundred research universities, thousands of investigators, large numbers of associated research personnel, numerous sponsoring agencies, and hundreds of different federal programs. Funds for research have multiplied manyfold. Institutions for formulating research policy, for assessing research proposals, and for administering research awards have grown in size and complexity. Administrative requirements have mushroomed. The number of individual research agreements in major research universities now lies in the range of five hundred to five thousand per university per year. What was a small, relatively simple, and intimate relationship has evolved into a very large, complex, and sophisticated enterprise.

As the enterprise grew, various modifications were made. For example, in the late 1960s audit responsibility for all research agreements at a given institution was consolidated under a single cognizant agency; most educational institutions were assigned to DHEW. This change was designed to relieve the problem of multiple audits by different agencies at the same institution. One consequence of this change, however, has been a decoupling of financial and administrative accountability from scientific accountability. This decoupling detracts from overall accountability.

The nature of federal support for research also has changed over the years. In the continuum between broad and categorical purposes, the balance has shifted markedly toward the categorical. Federal investment in higher education also has shifted toward support to individuals rather than to institutions.

The institutions in the research university community also have changed substantially over this period, in size, in complexity, in emphasis on research, and in extent of participation in the government-university research relationship. Over this period an interdependence between the government and universities has developed as they have cooperated in pursuit of knowledge for the public welfare. This relationship has been extraordinarily fruitful in scientific achievement.

The government-university relationship also has been affected by a significant change in resource climate. Current and persistent economic difficulties severely burden individuals, the universities, and the government.

These factors introduce strains in a relationship which is particularly vulnerable to strain for two reasons. First, the relationship is a composite of many individual relationships and few participants perceive the whole picture. Second, the nature and operating methods of the two partners are quite different. Consequently, there can easily develop a serious mismatch of expectations.

Process and Organization Differences

Processes effective for a production enterprise with a hierarchical organization are not necessarily transferable to other environments. Considerable adaptation of these processes is required if they are to work well in an environment where the mission is discovery—not production—and where individual investigators operate rather independently. Power, authority, and research direction in universities do not flow from the top down. University processes are quite decentralized and depend heavily on the judgment of peers. Intellectual curiosity and independence are prime motivators for faculty. University structures purposely are designed to encourage individual creativity and fresh approaches to problems. Federal support for research and development in universities is conveyed through grants and contracts with the university and the government as the formally contracting partners. But for most of these agreements the principal actor is the individual faculty member who either originates the research project or responds to a government request for a proposal to accomplish an objective set by the government. This relative autonomy of the faculty is not accidental; it is designed to avoid blind orthodoxy by the government or academicians, to encourage initiative, and to allow selection of the most promising individuals and ideas for support. Repeated evaluations of this project system of support during the last twenty-five years have affirmed the wisdom of this approach. But this autonomy does not always lend itself to the management processes developed for more hierarchical organizational structures. Indeed, some such processes are perceived as threats to the organization. The decentralized character of a university makes effective imposition of administrative regimentation difficult. The fragmentation necessitated by project grants compounds the problem. Management processes must accommodate to these structural characteristics.*

Distribution of Faculty Effort

Some of the difficulties involved in documenting faculty effort on externally sponsored projects can be traced to the assumption that faculty activity can be distributed without fundamental distortion. The university is very much a "mixed product" environment, where one particular activity often falls under several headings and where research, teaching, and service are meant to be so closely entwined that they cannot be disentangled. In such an environment, any documentation of faculty effort inherently will be imprecise, and even damaging if it forces artificial separations of functions. Another major source of difficulty is the fact that in universities there is no standard work week for professional personnel; time and effort are not the performance measures for these employees. They function on a work assignment basis and are evaluated on the basis of their performance, not the time or effort they spend.

Diversity of Institutions

The diversity among institutions is a valued national asset, but it contributes to the problem of developing uniform standards or procedures which are effective and equitable. Differences between public and private institutions, differences among states in the way public institutions are funded and managed, differences in traditions, organizational philosophies and priorities all affect the management structures and strategies used by universities. For all but a handful of these institutions, the federal research and development support, though it may be sizeable in absolute magnitude, is less than one-third of the total institutional budget. As such it cannot unilaterally determine the design of the management system for the institution. This fact is often overlooked in the design of the federal requirements for financial and administrative accountability.

Design of the Research Support System

Cost transfer problems are partly due to the conflicting expectations of auditors and agency project officers. The latter often focus on the scientific reason for a transfer and the ways projects are related, while auditors seek clean segregation of the costs of separate projects. These differences reflect differing interpretations of the principle of allocability stated in OMB Circular A-21. The cost transfer problem is also a result of the design of the support system. Support for research is received in multiple, discrete project awards of limited duration. Cost transfers are a direct consequence of this method of support, especially in cases where an individual investigator's overall program of research is funded from several sources so that some costs may be assigned as legitimately to one source as to another. Prudent management of the resources available to the investigator may dictate some legitimate but retroactive reallocation of charges, resulting in cost transfers.

Financial auditors have difficulty judging the reasonableness of such transfers. They begin with the assumption that all cost transfers are suspect and expect explicit documentation of their validity and justifiability. However, such documentation of cost transfers for each transaction is quite burdensome. An alternative approach is needed so that legitimate and illegitimate cost transfers can be distinguished without burdening the investigator with unnecessary documentation requirements.

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*The mechanisms for federal support of research and the assurance of quality are the subjects of separate studies by the National Commission on Research and will be treated in separate reports.

Late Arrival of Award Notices

The commonplace late arrival of award notices generates additional cost transfers because institutions frequently must draw upon internal accounts to initiate purchase orders and appointments to avoid serious delays or a hiatus in the work. Subsequent transfers to correct the charges once the award is received arouse suspicions of auditors. If not well documented they are subject to disallowance. Unauthorized diversion of government support for purposes genuinely outside the scope of the support agreement is, of course, improper. The basic problem is to distinguish proper from improper cost transfers without overburdening the system with documentation requirements or rigid rules, and to correct the flaws in the system which provoke cost transfers.

Increasing Specificity of Proposals

The trend toward increasing specificity in proposals for support of research adds to the cost transfer problem. Perhaps more importantly, it also leads to increasingly conservative approaches to research. In the review of basic research proposals, specificity can be useful for assessing the investigator's intellectual acumen. But if the investigator must adhere in detail to the proposal, it becomes a straitjacket, and it can stifle creativity and the pursuit of the unexpected results. Rigorous hewing to performance specifications may be appropriate for work under some procurement arrangements, but it is inappropriate for most basic research. A clearer understanding of the nature of research is needed, along with a greater congruence between the government and university expectations of the proper level of specificity.

Concern About Indirect Costs

The perception of a widespread accountability problem seems to have a relatively recent origin. Prior to 1970, audit problems occurred, but in what appeared to be isolated instances. More concentrated attention on matters of accountability can be traced to a noticeable increase in the indirect cost rates of colleges and universities beginning roughly a decade ago. Indirect costs are not well understood and are a source of considerable strife, both within government and within the universities. This is true even though indirect costs are based on a standard approach widely accepted by the accounting profession for allocating costs to joint activities. They are derived according to federal cost principles (OMB Circular A-21). Congressional concern that rising indirect cost rates were diverting resources from approved research led to increased audit scrutiny. Institutional practices which had been found quite acceptable in previous audits began to be questioned and criticized. In response, universities analyzed and explained the reasons for the rise in their indirect cost rates. DHEW, the agency responsible for auditing most colleges and universities, drafted a proposed revision of the cost principles designed to eliminate or limit the reimbursement of certain kinds of costs and to tighten the procedures required for documenting and allocating costs. Extensive discussions between DHEW and the universities ensued, culminating in their submission of separate proposals to the Office of Management and Budget. The revised principles issued by OMB in March 1979 were developed after extensive consultation with both university and federal agency representatives, but they are unlikely to bring full resolution of the difficulties.

The continuing disagreement derives primarily from the erosion of a mutual but largely unwritten understanding of the basic nature of the government-university relationship in support of research. Until this understanding is repaired, efforts to come to agreement on a set of cost principles are doomed to failure because the cost principles are merely a tool to implement the relationship. Under perceived congressional pressure for demonstrable action to improve financial accountability, OMB issued the revised cost principles. This postponed addressing the more fundamental and much larger problems.

Evidence of the Deteriorating Relationship

The evidence that the discovery process is being undermined by poorly fitting requirements for financial and administrative accountability is largely descriptive and impressionistic. It is exceedingly difficult to document with any precision the costs of lost opportunity, motivation, or morale. The Commission has interviewed many researchers and administrators from both the government and the universities during its brief tenure. On the basis of these discussions the Commission has no doubt that a substantial problem currently exists and that any further tightening of the requirements will only exacerbate the problem. The Commission also reviewed materials developed by others on this matter. A sampling of these materials is described briefly below. The resource and time constraints of the Commission limited it to this approach.

Previous Studies

Smith and Karlesky, in their book *The State of Academic Science*,[6] have described concern about the "subtle extension of inflexible controls that limit individual researchers' freedom of action" which they discovered in site visits to six departments in each of thirty-six universities. Additional evidence of faculty concern lies in the results of a survey of twenty-four departments granting the Ph.D. in chemistry, undertaken as part of the work of the Task Group on Accountability in Research of the National Science Foundation Advisory Council.[7] Three-fourths of the respondents believed that some of the regulations imposed to assure accountability are detrimental to research and identified one or more of the following as detrimental in their present form: financial accounting requirements, effort reporting, safety regulations, prior approval requirements, human subjects and animal care regulations, excessive reporting for one-year contracts, and "mindless" adherence to the original proposal.

In 1977 the National Science Foundation's Division of Policy Research and Analysis issued a report[8] entitled *The Effects of Federal Regulations on Colleges and Universities*. This report concluded that while the number and complexity of government regulations affecting colleges and universities have increased significantly in the last decade, there has been little empirical research as to the impact, cost, or effectiveness of the regulations.

Also in 1977 the Sloan Commission on Government and Higher Education invited twenty-one colleges and universities to examine the impact of the Federal government on them, each in its own way. A summary of the individual institutional self-study reports[9] reveals considerable concern about the government-university relationship, particularly with respect to the effort reporting burden and its incompatibility with educational institutions and the research process. There also was widespread concern about reporting requirements and the methods used for enforcement of regulations with fiscal purposes and with social purposes.

An example of this last concern is the regulations for research on human subjects. DHEW, EPA, DOE, FDA, the Consumer Product Commission, and the separate branches of DOD each have separate rules or regulations for the protection of human subjects. The National Commission for the Protection of Human Subjects acknowledged the burden of multiple rules and recommended that the responsibility for human subjects protection be delegated to a single agency, but such consolidation has not been accomplished. Institutional concerns include the high costs of the prescribed review procedures, inappropriately broad applicability of the regulations, unnecessary interference with legitimate research, delays, and threats to academic freedom.

The 1977 report[10] of the Commission on Federal Paperwork included a section on the paperwork burdens imposed upon the education community, particularly with respect to research grants and contracts. The report estimated that, if implemented, its recommendations could result in net savings of more than $190 million. The problems identified as most critical were documentation of personal services, accounting for nonexpendable property purchased by grantees, the manner of payment for projects by federal agencies to the institutions, regulations for the protection of human subjects, and the effects of multiple agency regulations in the same area. The Paperwork Commission analyzed a 1976 survey by the National Association of College and University Business Officers (NACUBO) of universities heavily involved in sponsored programs. Of the fifty-three institutions which responded, thirty-seven identified the documentation of personal service charges, including cost sharing, as one of the most burdensome of the record-keeping requirements.

An Association of American Medical Colleges task force examined "administrative excesses" in federal programs and expressed particular concern with redundance in grant application requirements, the burden of manpower reports to one agency, the frequency of progress reporting, and the documentation of effort charged to sponsored agreements.[11]

Individual Correspondence

Much of the evidence regarding the burden of regulation is found in letters of protest. For example, an MIT professor has cited the burdensome paperwork involved in obtaining NIH approval for recombinant DNA research: he had to submit the required Memorandum of Understanding and Agreement to NIH thirty-five times in three years. (Recombinant DNA research review procedures have since been improved.) The regulations on research involving children and the institutionalized mentally disabled recently proposed by DHEW drew a large volume of protest from investigators, some of whom indicated that the regulations would actually force them to stop work because of the added layers of review and monitoring. Final regulations have not yet been issued.

Congressional Concern

In introducing a bill entitled "Health Science Promotion Act of 1979" (S.988) to the Senate Committee on Labor and Human Resources, Senator Kennedy[12] stated that his subcommittee had heard a chorus of complaints concerning the inefficiencies caused by reporting requirements now imposed by federal agencies:

> No one disputes that the tax payer should be assured that his dollar is being appropriately utilized by the beneficiaries of Federal largesse. But at the same time, we must consider whether requirements aimed at assuring the accountability of expenditures are defeating the very purpose of these expenditures. We are told by some investigators that they now spend 25% of their time filling out forms and performing the various administrative chores necessary to keep their labs in operation. We hear of investigators spending 5-10% of their grant funds paying for the preparations necessary to justify their work to site visit teams from Federal research agencies. We see the sadness, anger and bitterness of many honest, well-intentioned, health researchers who feel that an atmosphere of distrust and hostility has developed between Federal agencies and researchers as a result of the tightening web of accountability requirements.

Adequacy of Evidence

The Commission believes that the evidence presented in this report is not necessarily decisive. A number of areas can be identified where careful analysis to supplement the available descriptive evidence would contribute to a better understanding of the problems. But the evidence presented herein is neither selective nor without weight. It represents only a sampling of the documents reviewed and the testimony received. A rigorous analytical approach would be expensive and difficult to undertake because the changes involved tend to be inherently difficult to measure and difficult to isolate. If such studies were deemed necessary in order to remedy the difficulties in the government-university relationship, both parties would have to be involved in planning them, and they would have to make some commitment to take responsible action based on their outcomes.

The Commission believes that adjustments to provide significant improvement in the relationship can be made without awaiting further study. In the following sections the conclusions and recommendations of the Commission are presented along with a proposed basic framework for the government-university relationship.

Conclusions

The Commission's review of issues about accountability yielded the following conclusions:

1. *The research universities and the government are not working together as well as they should. Their relationship has been strained by accusation and distrust, affecting the atmosphere in which research is being done. The quality of the relationship must be restored.*

The government-university relationship is a complex and pluralistic composite of many individual relationships. The aggregate relationship is constantly evolving. The evolution over the last decade has involved a noticeable deterioration, the result of many factors and numerous incremental changes. Actions or omissions of both parties have contributed to this deterioration. While the problems are limited almost entirely to fiscal and administrative matters, the results affect research productivity. If continued movement in this direction is allowed, it would surely enfeeble the national effort in research. Research, science, and technology play key roles in solving the present problems facing the nation and the world. We cannot reduce the effectiveness of our national research program without jeopardizing our future.

Therefore, the purposes and public functions of the government-university research relationship must be reaffirmed. The trend toward adversarial positions has to be reversed. An atmosphere of mutual trust and confidence must be restored. To achieve these ends, both the universities and the government will have to change some of their attitudes and practices. Both will have to move simultaneously and cooperatively to improve their relationship.

2. *The renewal of the government-university relationship should be based on principles and objectives which both partners understand and accept.*

Both the universities and the government must understand the means and the constraints which each uses to fulfill its responsibilities. The partners can take advantage of mutual interests and acknowledge common objectives, but they must also understand that research is not the sole concern of either. The different roles and independent objectives of the partners must be recognized.

Government officials should not lose sight of the advantages of having diverse and autonomous universities serve as a home of science. In turn, universities cannot be indifferent to the purposes of the government sponsorship of research. The serious responsibilities involved in the use of public funds demand scrupulous attention. The public has to be assured that considered decisions are made when investigators and research subjects are selected, that funds are spent for their stated purposes, and that adequate precautions are taken against fraud and waste.

Furthermore, the universities and the government have no time to lose in finding a satisfactory basis for continuing their partnership. The universities must assure the government that they have the resources and procedures to fulfill federal agreements. The government must recognize that there are well defined limits on its intervention into the policies and operations of the universities.

3. *Because of the diversity of activities undertaken within the relationship and the diversity of the institutions and sponsoring agencies undertaking them, the activities must be governed primarily by mutually adopted principles, standards, or objectives, and not by detailed procedural requirements.*

A significant amount of the stress between the universities and the government is due to the failure by universities to provide documentation adequate to meet federally imposed procedural standards, rather than to imprudent decisions, illegal actions, abuse of resources, or fraud. The stress may be in the form of compliance, rather than in its substance. Perhaps the stress can be reduced by simplifying the requirements and procedures, while making clearer and more effective the principles underlying the requirements and the objectives being sought by the procedures.

4. *The management and accountability procedures employed by the university and its research investigators must be consistent with both the terms of the specific research agreement and the academic environment. The nature and extent of federal constraints and involvement must also be tailored to the type of activity.*

Creative or exploratory activities are fundamentally different from production or development activities. Each requires a different approach for effective and nonintrusive accountability. A particularly supple approach is needed in the academic environment, where researchers perform multiple functions simultaneously and are accorded a high degree of independence in order to maximize their creativity. Forms of accountability which emphasize costing precision and detailed documentation, rather than judgments on the reasonableness of decisions, will have an adverse and potentially enervating effect on the efficiency, effectiveness, and enthusiasm of research performance.

5. *Academic institutions must regulate themselves more effectively, and the government must reduce its imposition of regulations to only those which are essential.*

Academic institutions must commit themselves aggressively to ethical behavior, skilled management, and quality of performance. These commitments must be addressed in ways consistent with the nature of the universities and their governance. While the ultimate responsibility in some of these matters must lie with individuals, the institutions must stimulate, facilitate, and reward individual responsibility. Institutions periodically must examine themselves to assure that their own management systems have sufficient controls, that they are operating as intended, and that dereliction in stewardship is promptly rectified.

Furthermore, universities have an obligation to consider how their activities affect the role, and the perception of the role, of the university in our society. The opportunism or irresponsibility of individual institutions or investigators can tarnish others by implication and can undermine the respect and confidence essential to a healthy set of relationships.

The government must recognize that the present burden of regulation strains the institutional capacity for compliance. Overregulation erodes institutional resources for productive work and demoralizes those whose dedication and inspiration are required for the advancement of knowledge. Most government regulations are designed to reduce or eliminate some form of risk. The key questions are the detail and the volume of these assurances, and how much risk can be reduced before the costs of further reductions significantly outweigh the associated benefits. At some point, the risks of overregulation become more serious than the risks the regulations are designed to address.

6. *An atmosphere of flexibility within an environment of reasonably stable fiscal support is essential for research to flourish.*

Inflexible controls and fiscal uncertainty have a decidedly negative impact on research performance and productivity, regardless of the nature of the research institution or performer. Stringent federal controls lead universities to impose restrictive institutional limits so that they can minimize the risk of cost disallowances. In this environment researchers act too cautiously and become wary of pursuing unexpected or unpredictable avenues of research. Present and future regulations should be assessed carefully for their impact on the flexibility conducive to research. Mechanisms for longer research commitments and for cushioning the termination of support also must be devised. An atmosphere of trust and confidence must be created to ensure the freedom investigators need to produce significant new results or ideas.

7. *The government and the university must recognize that current management technology is inadequate for some of the problems involved in accountability for research in academic settings.*

The management of large and complex institutions has become a profession and the subject of research. The main focus of managerial research has been on business and industry, which are hierarchical and production oriented organizations. Much less attention has been given to special managerial features and problems of nonprofit and public organizations, including government and the research universities.

To compensate for this inadequacy, the government and the university should explore alternative approaches to familiar problems, undertake pilot experiments in management of research, and stimulate research in disciplines which can themselves contribute to the resolution of the problems. Creative ideas for accountability in the university setting and for the research process are needed because the current systems have fundamental flaws. In particular, new approaches to effort reporting must be developed.

Principles and Objectives

The following section presents proposed principles underlying the conduct and support of research and proposed common research objectives of the Federal government and the universities.

The universities and the Federal government are each structured on principles which define their purposes and guide their actions. When there are differences between them over research policies and practices, the only acceptable solutions will be those which are compatible with the principles of both. Recognition and appreciation of these principles are, therefore, prerequisites for a good working relationship between them.

The following sections set forth two sets of principles: the principles held by the research universities and those held by the government. The universities' principles will appear obvious to persons in universities; the government's principles will be self-evident to those who work in government. Nevertheless, we have found that many university people do not know the government's principles or do not understand their importance to government officials and that, too often, government officials do not know or do not take seriously the principles of the universities.

Within the framework of the principles, broad objectives for the government-university relationship can be defined. These objectives may help the government and the universities to resolve some of the issues between them, and they may serve to guide the evolution of their relationship.

Fundamental Principles for the Research Universities

1. *The pursuit of new knowledge is one of the principal functions of a research university.*

The research university in the United States has become and should remain the principal center of fundamental research and scholarship. As a research center, it is an institution of unsurpassed performance, a model eagerly emulated by other societies.

2. *Freedom is essential to inquiry.*

The freedom of the scholar to pursue new knowledge wherever the paths of discovery may lead is essential to high achievement in research. This freedom is not absolute. It is limited in principle by moral and ethical constraints and, in practice, by the availability of resources. Imposing unneeded constraints weakens the spirit of inquiry, wastes talented minds, delays discovery, and hurtfully prolongs our ignorance.

3. *Research and teaching are inseparable.*

The search for new knowledge and the preservation and dissemination of established learning are interwoven in a research university; each makes an invaluable contribution to the other. Efforts to separate and distinguish them, whether for reasons of philosophical principle or administrative convenience, endanger the vitality of both.

4. *Diversity among research universities is a source of strength for the research program of the nation.*

Singly, each university provides strength in certain fields; together, the universities provide strength in all fields. The universities are diverse not only in the areas of strength, but also in their organization for research. The organizational differences derive partly from the decentralized way in which American higher education evolved and partly from research itself. Since research by its nature encounters the novel, the unknown, and the unexpected, universities naturally developed different approaches, practices, and structures for research. Such differences develop even within a single institution and are themselves a source of strength. Research universities which are dedicated to the discovery of the unknown should not be expected to be simple, monolithic, homogeneous, or administratively conventional.

Fundamental Principles for the Federal Government

1. *Government supports research in the national interest.*

The government supports the research and scholarship leading to new knowledge because of its responsibilities for the security and welfare of the nation. This principle has been stated explicitly in presidential, congressional, and budgetary messages. In supporting research, the government is not bestowing gifts or favors on institutions or individuals. Rather, it is building and renewing public investment in an important public asset.

2. *Public support demands public accountability.*

The people and their representatives must have assurance that the national research enterprise yields results commensurate with the public resources invested and that the resources made available to it have been expended responsibly. The Congress supports research. The Executive agencies manage research. The investigators and institutions conduct research. All are broadly accountable to the people who make their work possible and who share in its benefits.

3. *Government in the United States is pluralistic.*

Federal and state governments are intentionally constructed to serve many constituencies. They have many branches and agencies, linked and separated in a variety of ways, and bound by checks and balances. While uniformity in policies and practices often exists and is often desirable, extensive uniformity would reduce the flexibility of the divisions and agencies. They need this flexibility to respond to the constituencies which they must serve.

Objectives for the Relationship

The Commission believes that the following objectives are consistent with the foregoing principles and can serve as a useful guide for the government-university relationship.

The government and the universities together should seek:

1. To maintain, strengthen, and support the competitive processes used to assure integrity, objectivity, and excellence in the pursuit of new knowledge. These include fair and rigorous use of review processes, full scientific accountability in the selection of research directions and programs, and critical evaluation and dissemination of research results.

2. To develop and strengthen the institutional and the human resources which will ensure progress in research, and to attend especially to the responsibility for educating new generations of scientists and scholars.

3. To provide for the productive integration of instruction and research, for the benefit of both and the society they serve.

4. To support and accommodate diversity in both government and the research universities, for the sake of the strengths their diversity brings.

5. To improve the associations between the government and universities, to make them both stable and supple.

6. To achieve informed general recognition of both the necessity for adequate accountability and the primary measure of accountability, namely value received for investment.

7. To make joint efforts to find productive and nonintrusive ways of providing accountability.

8. To recognize that both government and universities have other constituencies whose needs have to be balanced along with those arising from their association in research.

9. To recognize that both government and the universities should share equitably the responsibility of supporting the national research enterprise, each in its own way, using its resources prudently.

10. To establish and maintain the national research capability at the highest level, capable, if need be, of responding to a national emergency.

Recommendations

1. ***The Commission recommends that research universities and the government make vigorous, concerted efforts to overcome the mutual suspicions, ignorance, and misunderstandings which strain their relationship and weaken the nation's research enterprise.***

Despite the close government-university relationship existing for several decades, ignorance and misunderstanding about the nature, needs, and behavior of the partners are pervasive on each side. This undermines the efforts of government and university officers to resolve specific problems. Neither the government nor the universities assure that their people understand properly the complexities of the relationship.

The Commission offers the following suggestions for implementing its recommendation:

(a) Federal officials, university presidents, and other officers responsible for the research enterprise need to examine *together* the fundamental principles and issues of the government-university research relationship and the system in which it operates. University associations, such as the Association of American Universities, and appropriate government officials should work closely with each other to organize and facilitate such dialogue.

(b) The government and the universities should each provide basic information about the government-university relationship to all new personnel responsible for research support and management, including faculty. Brief, simple materials should list the basic principles of the government and the research universities and the objectives of their partnership; should outline the federal cost and management principles; and provide a guide to pertinent institutions, agencies, legislation, and regulations which outlines who is responsible for what, how, and when. These materials should be developed jointly by representatives of the government and the universities. Information specific to the institution or agency also should be included, and its bearing on the larger structure should be made clear. A commendable example of such materials is the textbook associated with the National Aeronautics and Space Administration's Seminar in University Project Management for Technical Officers.

(c) Both government agencies and universities should provide continuing education in research program management for their staffs and faculties. The objectives of such programs are awareness of the customs of and constraints on the different participants in the research process and improvement in management for research.

(d) It is important that faculty researchers be kept informed about federal developments relevant to research performance and management. One effective and economical way to do this would be to have an education association (e.g., the Council on Governmental Relations or the Association of American Universities) prepare a "syndicated column" or "news service" which could be disseminated via the weekly newsletter of the American Council on Education and published in campus newspapers. In brief, readable paragraphs, this service would provide notice of important developments with references to sources of more complete information.

(e) Educational and research management associations should explore ways to bring fundamental issues in government-university research relations into public forums for constructive discussion and debate. These should include Congress, the press, and national public radio and television.

2a. ***The Commission recommends that research universities and the government develop a new system for accountability tailored to the nature of the activity being sponsored and based on a set of minimum core requirements applicable to all research agreements. The core requirements would be sufficient for all basic research and for some applied research; further requirements would be added only for activities of a pronounced procurement character.***

Federally sponsored research in universities covers a wide range of activities. This includes generation of new knowledge in a general discipline or group of disciplines; research in a specific area targeted on federal objectives; development, testing, and demonstration; and manufacture or service characterized by provision of a specific product. The government-university relationship for these activities varies from a support (or assistance) mode to a procurement mode, but all the activities are currently burdened with a set of financial accountability requirements appropriate for *procurement* of specific, deliverable items. It is important to recognize that much of the university-based research does not need the hard edge of the procurement policies. Much of the university research will never be amenable to such requirements. The Commission suggests tailoring requirements to fit the nature of the activity, in order to protect the flexibility essential for productive research.

The Commission views the Grants and Cooperative Agreements Act (Public Law 95-224) as one starting point for evolving a better system for federal research support. In implementing the Act it will be very important not to overlook the influence of long-established agency traditions and attitudes about the type of agreement the agency uses to support research. (OMB solicited public comment on the draft working papers for a study, as mandated by the Act. The Commission submitted extensive comments on these working papers. Copies of these comments are available from the Commission.)

The proposed system of accountability would contain core requirements sufficient to avoid fraud and diversion from the purpose of the activity, broadly defined. These core requirements would be applicable to all research universities. As far as possible, they would be in the form of principles or standards rather than specific procedures. This form would allow for the diversity of the universities' organizational structures and accounting systems. These core requirements would be the only requirements for basic research and some applied research, whether or not the work is undertaken in support of a specific federal mission. Additional sets of requirements would be coupled with the core requirements when closer government oversight of scientific or fiscal matters is consistent with the nature of the activities and agreement.

The Commission recommends developing a very limited number of such additional sets of requirements. A larger number would exceed the administrative capacity of both the government and the universities. The selection of the particular set of requirements would be determined by the *nature* of the activity. It would not be determined by the title of the agreement (i.e., "grant," "cooperative agreement," or "contract") or other kinds of labels such as basic research, applied research, or mission-oriented research.

Detailed analyses of OMB Circular A-21 and its recent revision and OMB Circular A-110 were beyond the scope of this Commission. However, the Commission study of accountability problems led us to recognize that these cost and management principles do not provide the *optimal* principles for federally sponsored research agreements with universities. Although the principles provide important safeguards for both the government and the universities, some needs of each remain unmet. Some government representatives believe the principles provide inappropriate latitude and inadequate control against waste or abuse. University representatives believe the principles incorporate some requirements which are unproductive, intrusive and counterproductive, or out of proportion to the risk of federal funds. The Commission believes that these differences arise because the principles imperfectly accommodate the nature of the government, the nature of the universities, and the nature of the activity involved, and because there are significant differences in expectations regarding the purposes of the government-university research relationship. Therefore,

2b. *The Commission recommends that the Office of Management and Budget, in consultation with the federal agencies which sponsor research and the universities, revise the federal cost principles (Circular A-21) and the federal management principles (Circular A-110) as soon as possible, but certainly within three to five years. The revision should assure that these guidelines for financial and administrative accountability (1) incorporate features which not only control against abuse but also facilitate and encourage effective management, (2) are fully consistent with the nature of the research process, (3) accommodate better to the academic environment in which they must operate, and (4) are based on better mutual understanding of the purposes of the government-university research relationship.*

In the following paragraphs, the Commission makes several specific recommendations. Some of these will require adjustments in A-21 and A-110 requirements. These adjustments will relieve the current difficult situation, but they probably will not suffice. A thorough re-examination is needed, based on a recognition of the underlying operating principles of the government and universities, and the mutual objectives of their relationship.

3a. *The Commission recommends, as a minimum, that the Office of Management and Budget institute new procedures to allow an opportunity for research funding agencies to comment on draft audit findings covering their university projects. This arrangement would be roughly parallel with current practices involving draft GAO management audit reports, and would provide relevant information for the audit agency.*

3b. *In addition to the above review, the Commission recommends, as an optimum, that agency program officers supplement their review of final scientific reports with advisory observations concerning the reasonableness, from a research standpoint, of the expenditures for personnel. The records of sponsoring agencies subsequently would be useful for the independent financial audits. This would link the technical review and the financial audit, an important linkage now missing.*

The Commission understands and supports the importance of the independent financial audit in public management. The Commission has observed that a major cause of stress in the government-university research relationship is the extent to which auditing and research program management are separated. Therefore, the Commission has sought better arrangements to narrow the separation without either compromising the independence of the audit or subordinating research management responsibility to the fiscal audit.

The Commission notes that the present system of scientific accountability, which relies heavily on the effectiveness of the selection process, seems to work very well. The competition for initial and renewed support focuses considerable emphasis on the productivity and significance of previous research. Only those investigators who do not immediately seek additional support escape this assessment of their work. Evaluation of the productivity of research projects separate from that involved in the selection process would be difficult, costly, and draining on limited research resources. A preferable approach would be periodic evaluation of the productivity of a sample of research activities as a test of the efficacy of the selection system.

The Commission proposes that the federal agency program officers accept responsibility, in the course of their appraisal of progress or final scientific reports by investigators, for documenting their views on the reasonableness of deviations from originally planned research protocols and expenditures for personnel. Independent post audits, which normally occur long after the completion of the project, would take into account such information at its full value. In this way, the auditor would have the benefit of both the programmatic appraisal of the investigator's work and a timely judgment by the technical officers as to the context of applied effort and variances from proposed research patterns.

The Commission recognizes that this review would be costly and might not be feasible with current program officer staffing. For this reason, it proposes, *as a minimum*, introduction of new procedures to provide for research funding agencies to comment on draft audit findings covering university projects they have sponsored. This provision would help assure that at least some input from those best able to determine scientific accountability would be made available for use in the ultimate audit resolution.

4. *The Commission recommends a simpler and less costly method of effort reporting based on responsible self-regulation: the explicit certification by individual investigators that direct salary charges to their research agreements are reasonable and fair, coupled with the federal program officer's review of the reasonableness of these expenditures for the work undertaken.*

The Commission has given special attention to the recurring disagreements about documentation for salaries and wages charged to federally sponsored agreements. Recommendation 4 deals with direct costs; recommendation 5 will deal with indirect costs. The government standard has been the industrial model of frequent time or effort reporting on an after-the-fact basis. As the magnitude of funds involved has increased, the government has sought more comprehensive and more detailed reports. Although the new federal cost principles in OMB Circular A-21 state that "reasonable accurate approximations" are sought, they require documentation of any apparent change in effort distribution, whether or not that change is significant.

Universities, however, operate on a work assignment basis. Hours worked or effort expended are not used as performance measures for professorial or professional personnel. There is not, nor should there be, a standard work week for these individuals. The activity of professional personnel in universities has a complex, multipurpose, joint-product character. The level of precision implied by the federal reporting requirements exceeds what can honestly and usefully be accomplished.

Ironically, the same characteristics of universities which fit poorly with the industrial model of effort reporting are essential for the special contributions universities make to the nation's research enterprise. Unfortunately these characteristics also lead to concern about accountability for public funds. If faculty activity simultaneously serves multiple functions where the government may have unequal interests, it is difficult for the government to assure that it only reimburses its fair share. It is also difficult to avoid over-recovery, intentional or unintentional. The recent struggle to revise the federal cost principles applicable to colleges and universities was largely driven by the desire of both the government and the universities to find satisfactory answers to these questions. Unfortunately, the revised cost principles still are not satisfactory.

A simpler and less costly method is needed. The new method should both fit the nature of the research organizations and provide accountability for public funds. To this end, the Commission recommends a new approach for documentation of direct salary charges. In lieu of effort reporting, the documentation would consist simply of (1) the report by the university of the salaries charged to the sponsored agreement; (2) the explicit certification by the investigator that the direct expenditures for salaries and wages are fair in terms of the research agreement; and (3) the assessment by the federal program officer of the reasonableness of these expenditures for the work undertaken. The program officer's acceptance of the reasonableness of these expenditures would constitute the formal determination of their allowability. Periodic audit of the institution's payroll system would be undertaken by federal auditors or independent auditors to assure that the system has adequate controls against fraud.

This approach reflects the actual work assignment process, uses information from those most knowledgeable, provides for checks and balances within the institution, and provides for independent audit of the payroll system. It would actually improve accountability, since it provides for consideration by the government of reasonableness of salaries charged in terms of work undertaken.

5. *The Commission recommends that government agencies and universities jointly construct an option, analogous to the "standard deduction" in income tax calculation, to charge activity which is treated as indirect costs under sponsored agreements. The fixed percentage would be negotiated. It might either be uniform or vary from institution to institution. Some universities would not receive full credit for their allowable indirect costs. However, accountability would be fully served and both government and universities would reduce the burden of detailed accounting and audit.*

Faculty effort devoted to activities charged as indirect costs, such as departmental administration and research administration, is especially difficult to document. This effort tends to be a relatively small percentage of an individual's total assignment, it is usually intermittent, and it may fluctuate throughout the year. However, the annual and institutional aggregate of such faculty effort is sizeable. The extent of faculty engagement in such activity is heavily influenced by the organizational details and philosophy of the particular institution. The cost of such activity is likely to vary among institutions, but may vary little from year to year for the same institution.

The current and revised cost principles already provide an option for "small" institutions, those with less than $3 million per year in federally sponsored project funds, to select a simplified general procedure for calculation of indirect costs. The Commission is recommending introduction of another option by which any institution could elect a modest fixed percentage recovery for the indirect cost component for faculty administrative work allocable to organized research. This fixed percentage charge would be used in lieu of full recovery based on full documentation and would allow some simplification of the present burdensome documentation requirements. Such an approach would be analogous to the option to use either the standard deduction or documented itemized deductions in income tax calculations. It would remove a source of recurring stress in the government-university relationship.

The setting of the fixed indirect cost rate should provide fair compensation and assure that the cost to the government would not exceed actual allowable costs. While a standard fixed rate, applicable for all institutions which elect the option, would be the simplest to administer, it may be necessary to provide for individual negotiations to set the fixed rate in an equitable manner. If the latter were the case, the fixed rate should be set for multi-year periods. Whether or not to use the fixed rate option should be the choice of the institution.

When coupled with the simplified approach for documenting salaries charged as direct costs (see Recommendation 4), the "standard deduction" option would provide good accountability. It would use methods more appropriate to the research environment and less costly for both the government and the universities.

The "standard deduction" option also could be used in conjunction with other methods of documenting salaries charged as direct costs. If it were employed with the monitored workload method given in the revised Circular A-21, that method would become a real option for many institutions which now find it unworkable to project workload assignments for indirect cost activities for faculty.

6. *The Commission recommends that university presidents review their financial management systems. Universities should invest sufficient resources to ensure adequate control and accounting for the expenditure of research funds. These systems must provide timely and accurate financial information necessary for effective research management by research investigators. In turn, research investigators must meet the responsibilities and obligations which accompany their use of public funds.*

In making this recommendation, the Commission is stating the obvious. Some universities have not adequately adapted their financial management systems to accommodate all the special requirements imposed by the use of public funds. One aspect is most often addressed inadequately. This is the timely and accurate financial information necessary to university researchers for prudent management of research programs. Without such information other accountability problems inevitably follow.

In universities the individual researcher has the primary operational responsibility for both the scientific and fiscal project management of federally sponsored research. The universities must ensure that their researchers recognize and meet this responsibility and therefore must provide them with the management information they need to do so, e.g., current expenditure and cost encumbrance information.

Most universities have tried to shield their researchers as much as possible from the burdens of administrative work. However, given the project system of support, such insulation actually can undermine the researchers' ability to carry out their operational responsibilities. A new balance must be struck to promote more informed and effective collaboration between researchers and administrators in universities. This will be fostered by improved federal accountability requirements which are productive and appropriate to the research process and the organizational environment.

7. The Commission recommends that the government and universities develop revised financial and scientific accountability processes which increase the flexibility and incentives for investigators to manage research funds in a scientifically prudent manner.

The Commission has become convinced that improved accountability for public funds will not emerge from imposition of tighter controls no matter how rigorously they are enforced, and that such an approach will exacerbate the present problems. This approach would result in large part from a combination of ill-fitting, unproductive, and excessive requirements, suspicion and distrust growing out of different perspectives and expectations regarding the government-university relationship, and an accumulation of regulations to the point of overloading the institutions' capacity to respond.

The present rules erect artificial and unnecessary barriers to resource sharing, economy measures, and re-budgeting to respond to research or management opportunities. Mechanisms for increasing the flexibility of investigators to manage the resources should be provided. With more flexible arrangements, investigators can amplify the purchasing power of their funds and take proper advantage of unanticipated leads in their research. Without flexible arrangements the creativity and innovation for which the funds are provided is impeded.

The Commission applauds the flexibility provided many years ago by the pioneering work of the NIH in delegating certain prior approval authority to grantee institutions and more recently by the NSF in its experiment in post-award administration. The Commission believes that these approaches should be expanded in scope and adopted by other agencies. Recommendations 8 through 10 suggest how these objectives can be accomplished.

This recommendation for increased flexibility is purposely directed at both the government and the universities. Some institutions are overly cautious in their responses to federal requirements, while others must contend with state regulations that are complex and also may conflict with the federal regulations. The result can be institutional interference with research not required by the federal provisions. The Commission urges all institutions to examine the necessity of their own restraints on the flexibility of the investigator.

8. The Commission recommends that agencies delegate to the universities more authority to make budgeting and management decisions under sponsored agreements.

During the period of a sponsored agreement, changes in the original budget or management plans may become necessary. For most agencies, certain changes require the written prior approval of the agency. Such approval is almost always forthcoming, but the approval process introduces delays and paperwork. Delegation of the authority to give prior approval to an Institutional Prior Approval System (as NIH and NSF have done for certain changes) makes the university responsible for enforcing the government requirements using the government's criteria for making the decision. Such delegation places the responsibility in the hands of those who have the information for prudent judgments and reduces both paperwork and delays in obtaining decisions.

The key elements in an Institutional Prior Approval System (IPAS) are:

(a) Local decision-making structures tailored to the particular institution and designed to preclude conflict of interest. Normally, an institution would develop a single, campus-wide IPAS system, but situations may arise where a separate system might be necessary to meet the needs of a portion of a campus. Different institutions and different campuses within the same institution will probably develop different systems. All systems will provide for the project director's approval and independent review of propriety and allowability for the decisions involved.

(b) Accreditation of an individual institution's prior approval system by a single federal agency so that the system need not be reviewed separately by all the agencies which have sponsored agreements with the institution.

(c) Delegation of the same decision items by all participating agencies, such as acquisition of special purpose equipment costing more than $1,000, rebudgeting of equipment or travel beyond the limitations presently imposed, no-cost extensions of contractual periods, and the pre-award costs described in Recommendation 10 below.

(d) Reservation by the government of prior approval authority for

—change in project director;
—significant change in project director's level of effort;
—significant change in scope of work;
—change in the Institutional Prior Approval System itself.

These reservations, together with overall cost limitations, protect agency control over major budget elements.

(e) Documentation of decisions made within the Institutional Prior Approval System, including certification that the prescribed criteria have been considered by authorized individuals.

(f) Provision of information about delegated decisions to the funding agency program manager.

(g) Periodic audit of the institution's compliance with the charter of its accredited prior approval system.

The establishment of an IPAS in any university will of course require the approval and agreement of both the government and the university. A university which seeks approval of an IPAS must be free to design a system to suit its own structure and needs, but the government must be convinced that the proposed design will provide the necessary accountability. It must be understood by the university and its researchers that the benefits of an IPAS can be obtained only at the cost of assuming the burden of the responsibility it entails, and that the performance of the system is subject to government review and audit.

Widespread use of Institutional Prior Approval Systems will increase the productivity of government research funds and will reduce the administrative work of sponsoring agencies. The IPAS is not a new approach. The NIH system of limited delegation of prior approval authority has operated successfully for about fifteen years. The current NSF experiment with greater delegation has been judged highly successful in its preliminary evaluation. The Commission is recommending the expansion of a concept which has already been tried. Over time, widespread and successful operation of such systems should lead to expanded responsibility and flexibility for the universities, with greater accountability, productivity, and cost savings for both sponsoring agencies and universities.

9. ***The Commission recommends that Congress authorize and agencies develop arrangements for aggregating individual research projects for administrative purposes.***

Related research programs funded under several agreements or by several federal agencies need arrangements for post-award aggregation of their administration. This also would streamline the administration of multiple awards from the same agency to investigators in a single department or other university unit. The narrow focus of many individual research agreements has introduced unnecessary barriers to good management and has created cost transfer problems. Aggregation for post-award administration would (a) facilitate effective use of funds by reducing the necessity of cost transfers among related projects; (b) allow efficient pooling of resources; (c) eliminate the pressure for end-of-year spending associated with one-year continuing grants; and (d) simplify effort reporting for individuals whose projects are contained within the aggregate.

Aggregated awards would allow for both scientific and financial accountability. Aggregation would not jeopardize the control by the individual investigator, because the project director must approve movement of funds from a project within the aggregate. Scientific reporting would be done as it is now, with each investigator responsible to report to the sponsoring agency on each award received. The integrity of congressional authorizations and appropriations is carefully maintained, because aggregation is post-award and scientific reporting is maintained on a project basis.

The administrative efficiencies of aggregated arrangements would benefit investigators, universities, and the government. The strong incentives investigators have for controlling the resources they have developed, and the institution's authorized prior approval system (described in Recommendation 8), provide the checks and balances necessary for ensuring that the sponsoring agency's intent is preserved.

It should be noted that some efforts toward aggregation already are being made, e.g., the mechanisms provided by the Joint Funding Simplification Act and the recent NSF Master Grant Experiment with selected chemistry departments.

10. *The Commission recommends that government agencies improve the management of research funds by eliminating unnecessary constraints on the timing of expenditures. Specifically, the Commission recommends institutional authorization for pre-award expenditures up to 90 days prior to the effective date of awards and for carry-over of surpluses or deficits to the following contractual period, at least up to a specified percentage of the total award for that period. This involves no risk or commitment by the sponsoring agency.*

Expenditures incurred prior to the effective date of an award or beyond its expiration date are not usually allowable. These restrictions assume that research can be forced to operate within an annual cycle. They underestimate both the likelihood of uncertainty and the importance of stability and continuity in the research process.

The Commission recommends delegation to the institution of the authority to approve expenditures which are beneficial to the research up to ninety days before the effective date of the award. This provision would facilitate equipment ordering and recruitment of personnel for new projects and would enable continuing projects to proceed without interruption. The provision will require some risk management by the universities, because the awards they anticipate receiving sometimes are not finally funded.

The Commission also recommends that project directors be permitted to carry over surpluses (or deficits) to the following contractual periods, at least up to a percentage ceiling. This provision would eliminate some of the impetus for cost transfers, reduce inefficient expenditure patterns, and reduce administrative costs. Tight budgets and future uncertainties now force investigators to choose among artificially narrow options when research directions change, when unexpected delays yield a balance at the end of a budget period, or when an award is delayed. Limiting carry-overs to a fixed percentage of overall expenditures will provide safeguards for the government while allowing needed flexibility for research.

11. *The Commission recommends that Congress, the agencies, and the universities assure that the processes of accountability themselves meet the tests of accountability. The processes should yield results which justify their cost. One important application of this principle would be the elimination of the documentation now required by legislated cost-sharing on research grants.*

The practice of accountability is not free. The universities and the government are both prepared to pay for sound accountability practices. Where there is little or no return for the accountability effort, those accountability requirements should be set aside for they drain both energy and resources from the research staff. The distinction between fitting and gratuitous requirements can be a difficult matter of judgment, involving careful consideration of the balance between the cost and the benefits of the requirements.

A clear-cut example of a gratuitous requirement is documentation of legislatively mandated cost-sharing in research grants to universities. Universities bear a significant part of the cost of basic research in this country, because they accept research as one of their principal functions. For their own purposes they have little or no need to budget or account separately for such activities. Specific documentation of the cost-sharing now required by statute for research grants has virtually no effect on the amount of research support the institutions provide. The documentation does impose a costly paperwork burden on the institutions while exacerbating the effort reporting problem by adding another category of faculty member effort.

Despite recommendations to eliminate the general cost-sharing requirement by the Government Procurement Commission, by the Interagency Task Force which studied the recommendations of the Procurement Commission, and by the Federal Paperwork Commission, the requirement remains in force. The time has come to rescind it.

Another example of nonproductive documentation is the current effort reporting methods which are discussed above along with proposed alternative methods under Recommendations 4 and 5. These methods require detailed documentation of personnel activity distributed into numerous categories and documentation of any apparent change in effort distribution, whether or not the change is significant. Such requirements ignore the essential interrelatedness of the activities and overlook considerations of materiality. They demand a precision which exceeds what honestly can be provided. They defeat the purpose of accountability.

Toward Improvements: An Evolution

In the course of its study on accountability, the Commission received information and views from scores of persons in government and in the research universities. Some general observations and reflections arose from our experiences in addressing these matters. These observations are:

1. The difficulties between the universities and the government over accountability, and over other issues as well, have not appeared overnight. Nor is it likely that they can be caused to disappear in a short time.
2. Since the government-university relationship is an important national resource, its evolution is perhaps too critical a matter for a laissez-faire approach.
3. The Commission's relatively broad-based membership and freedom from institutional obligations has broadened the perspective and increased the objectivity of each member. In its deliberations the Commission often felt the need for participation of more representatives of the government as members. This was despite the generous contributions of time and thought which government officials gave to the Commission through testimony and consultation.
4. The Commission's isolation from day-to-day controversies between the universities and the government was an advantage in its work.

The Commission believes that there is a gap between the government and the universities. This requires a bridging process whereby the concerned parties can see the relationship *as a whole*, and guide its evolution in directions that assure its strength and vitality. Although the Commission has not yet settled on a solution, we offer for discussion the following preliminary suggestion:

> **The creation, as an experiment for five years, of a new, independent Forum whose purpose would be to watch over the government-university research relationship and to guide its evolution.**

Such a Forum should provide a non-adversarial setting. Here persons from the public, Congress, universities, and federal agencies would address the major policy issues and problems in the research associations between the universities and the government. They would derive effective responses in terms of the objectives of the relationship and its overall role in the national research enterprise.

Such a Forum should not be a debating society. Nor should it be a substitute for the organizations which deal with the day-to-day problems in the government's sponsorship of research in universities.

If convened by a highly respected non-governmental or quasi-governmental organization, or by a private foundation with a strong interest in the national research enterprise, perhaps such a Forum could accomplish what present structures have been unable to do.

Appendix I: References

1. Office of the Inspector General, U.S. Department of Health, Education, and Welfare. *Annual Report*, January 1, 1978-December 31, 1978. (Washington, D.C.: U.S. Government Printing Office, 1979).
2. General Accounting Office. *Federally Sponsored Research at Educational Institutions: A Need for Improved Accountability.* (Washington, D.C.: U.S. Government Printing Office, 1978).
3. General Accounting Office. *Need for More Effective Audits of Higher Education.* (Washington, D.C.: U.S. Government Printing Office, 1979).
4. The Science and Technology Message of the President Transmitted to the Congress. March, 1979.
5. Staats, Elmer B. "Federal Research Grants." *Science*, vol. 205, July 6, 1979.
6. Smith, Bruce L. R. and Karlesky, Joseph J. *The State of Academic Science: The Universities in the Nation's Research Efforts*, Volume I, Summary of Major Findings. (New Rochelle, New York: Change Magazine Press, 1978), p. 6.
7. National Science Foundation Advisory Council. "Accountability in Research: Report of Task Group #7." October, 1979.
8. Schiffel, Dennis D.; Windus, Margaret L.; and Anderson, Roxann M. *The Effects of Federal Regulations on Colleges and Universities*, A Report of the Division of Policy Research and Analysis, National Science Foundation. (Washington, D.C., 1977).
9. Spero, Irene K. *Government and Higher Education, A Summary of Twenty-One Institutional Self-Studies.* Sloan Commission on Government and Higher Education, 1978.
10. Commission on Federal Paperwork. *Report on Education.* (Washington, D.C.: U.S. Government Printing Office, 1976).
11. *Report of the Task Force on Administrative Excesses of Federal Programs of the Association of American Medical Colleges.* (Washington, D.C.: Association of American Medical Colleges, 1978).
12. Kennedy, Senator Edward M. Speech Introducing the Health Science Promotion Act of 1979. *Congressional Record*, April 23, 1979, pp. S4471-S4486.

Appendix II: Sources

The Commission is indebted to the many persons who have provided information and advice, and it wishes to acknowledge its appreciation for their efforts. Invited expert witnesses have testified on the issues within the Commission's purview at its monthly meetings; open hearings have been held on four university campuses; subcommittees have met with individuals and groups from the Federal government; and members and staff have attended or made presentations at meetings and hearings convened by educational associations, government agencies, and Congress.

Witnesses. The following individuals presented views and gave assistance in the development of this document. The Commission wishes to emphasize that the views in this document are its own and not necessarily those of the listed individuals. This list includes meetings through January 1980.

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Howard W. Bremer, University of Wisconsin
Newton Cattell, Association of American Universities
Honorable Lawton Chiles, U.S. Senator from Florida
Robert Coakley, U.S. Senate Subcommittee on Federal Spending Practices and Open Government
Camden Coberly, University of Wisconsin
Stephen Cole, State University of New York Stony Brook
Tom Collins, University of California, Los Angeles
Theodore Cooper, Cornell University
Lawrence G. Crowley, Stanford University
Robert Cutler, National Science Foundation
John M. Deutch, Under Secretary, Department of Energy
Sidney Drell, Stanford Linear Accelerator Center
Marvin E. Ebel, University of Wisconsin
Gretchen Engquist, U.S. Senate Subcommittee on Health and Scientific Research
Kristine Forsberg, Department of Energy
Osmund Fundingsland, General Accounting Office
George Gamota, Department of Defense
William Gibb, U.S. Senate Committee on Commerce, Science and Transportation
Howard Gobstein, General Accounting Office
Delphis C. Goldberg, U.S. House of Representatives Subcommittee on Intergovernmental Relations and Human Resources
Milton Goldberg, Council on Governmental Relations, National Association of College and University Business Officers
Art Heming, National Institute of General Medical Sciences
Robert W. Hougas, University of Wisconsin
William Kays, Stanford University
Bryant Kearl, University of Wisconsin
Thomas J. Kennedy, Jr., Association of American Medical Colleges
Charles V. Kidd, George Washington University

Richard M. Knapp, Association of American Medical Colleges

Philip Kropatkin, Deputy Director, Audit Agency, Department of Health, Education, and Welfare

Sanford Lakoff, University of California, San Diego

John Lordan, Office of Management and Budget

Reuben Lorenz, University of Wisconsin

Hugh Loweth, Office of Management and Budget

David Mears, University of California System

George Millburn, Department of Defense

Bryan Mitchell, Assistant Inspector General, Department of Health, Education, and Welfare

Thomas Morgan, Association of American Medical Colleges

Morton Myers, General Accounting Office

Robert Newton, National Science Foundation

Tom O'Brien, National Eye Institute

Gilbert S. Omenn, Office of Science and Technology Policy

George Pake, Xerox Corporation

J. Thomas Parmeter, Michigan State University

James Pike, National Heart, Lung, and Blood Institute

George Pilarinos, National Aeronautics and Space Administration and National Science Foundation

Dennis Prager, Office of Science and Technology Policy

Simon Ramo, TRW, Inc.

William F. Raub, National Institutes of Health

Jerold Roschwalb, National Association of State Universities and Land-Grant Colleges

Halsey L. Royden, Stanford University

Robert Ryan, Office of Naval Research

Steven Schiaffino, National Institutes of Health

Helen Schroeder, National Institutes of Health

Reagan Scurlock, Council on Governmental Relations, National Association of College and University Business Officers

Richard Sessions, University of California, Los Angeles

Irving Shain, University of Wisconsin

Paul Sitton, National Academy of Sciences

Donald Speer, National Science Foundation

Elmer B. Staats, Comptroller General of the United States

Richard E. Stephens, Department of Energy

Eldon Taylor, Inspector General, National Aeronautics and Space Administration

Thomas van der Voort, U.S. Senate Committee on Appropriations

Len Van Ess, University of Wisconsin

David Wilson, University of California System

Raymond Woodrow, formerly with Princeton University

Richard G. Woods, Office of the Honorable Henry L. Bellmon, U.S. Senate

Edwin Young, University of Wisconsin

Agency Liaison. These persons have been appointed by their agencies:

Salvatore Cianci, Alcohol, Drug Abuse, and Mental Health Administration
George P. Millburn, Department of Defense
Richard E. Stephens, Department of Energy
Osmund Fundingsland, General Accounting Office
Walton Francis, Department of Health, Education, and Welfare
James R. Lawson, National Aeronautics and Space Administration
William F. Raub, National Institutes of Health
Jack Sanderson, National Science Foundation
Eliot R. Cutler, Office of Management and Budget
Philip M. Smith, Office of Science and Technology Policy.

Open Hearings. Some sixty persons testified before the Commission during hearings at the national conference of the American Association for the Advancement of Science and on the campuses of the University of Alabama, Birmingham; California Institute of Technology; Stanford University; and the University of Wisconsin, Madison.

The Commission especially wants to acknowledge the contributions of the fifty-eight persons who reviewed a draft of this manuscript on a confidential basis.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Attachment D

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SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF PHYSIOLOGY
SCHOOL OF MEDICINE
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SAN FRANCISCO, CALIFORNIA 94143

February 20, 1980

Dr. Donald S. Fredrickson
Director, National Institutes of Health
Bethesda, MD 20205

Dear Dr. Fredrickson:

The enclosed document is based upon the notes that were used in my presentation of the indirect cost allowance issue at the February 4, 1980 meeting of the National Advisory Eye Council. These notes have been somewhat amplified as the result of additional thought about this issue. The aim is to provide you with a carefully prepared document that outlines the main aspects of this issue as clearly as I can. Please feel free to use this document in any way that you deem helpful. I trust that you will find the information and reasoning a sufficient basis for the requested study. If I have been successful in identifying and describing the main aspects of this issue, I trust that this document may also provide a useful starting point for those who participate in that study.

Respectfully submitted,

Kenneth T. Brown

Kenneth T. Brown
Professor of Physiology

KTB:mr
Enclosure

Kenneth T. Brown

Presentation of the Indirect Cost Allowance issue to Dr. Fredrickson, Director of NIH, at meeting of National Advisory Eye Council on Feb. 4, 1980

Introduction

I have been asked by Dr. Geller to introduce this subject, and to begin by reviewing briefly the history of this subject, as it has been treated by the NAEC. Some review is required, since 5 new Council members are meeting with us for the first time. Following this review, some newly developed information will be presented, and some critical aspects of the issue will be commented upon. It is hoped that this will provide a useful groundwork for discussion of this issue.

History of this issue in NAEC to date

At the last meeting of the NAEC, in October, Dr. Kaufman and I expressed particular concern that the rapid growth of the indirect cost allowance in recent years appears to have reduced significantly the funds available for direct research costs. If so, this is a budgetary problem of major import to the NEI and to the research community which it supports.

Since the policy level for indirect cost allowances is Congress, with the administration of those policies carried out by the General Accounting Office, of course this Council has no jurisdiction over that issue. But we are directly involved with NEI budget matters that are affected by the indirect cost allowance, so it seemed appropriate that we make our views known on this issue.

Since this issue affects the entire NIH similarly to NEI, it was decided that a resolution should be drafted requesting that Dr. Fredrickson, as Director of NIH, undertake a re-examination of this issue. Following the Council's request, Dr. Kaufman and I then drafted the resolution, which was approved unanimously and sent to Dr. Fredrickson.

At a meeting on Nov. 20, 1979, when the NEI presented its 1982-1984 Research Forward Plan to Dr. Fredrickson, NEI staff and some members of this Council discussed the issue further with Dr. Fredrickson.

Today Dr. Fredrickson has joined us to discuss this matter in more detail.

Significance of, and reaction to, this Council's Oct. resolution

Our initial resolution to Dr. Fredrickson was drafted in considerable haste, with full knowledge that this might result in an imperfect document, but our overriding concern was to urge consideration of this matter as soon as possible.

The main thrust of our resolution was in the 7-point summary of reasons for considering that this issue now requires re-examination. The specific recommendation to reduce indirect costs by 1/3 was only given as an example of the kind of action that might be taken. In fact, following Council discussion at the Oct. meeting, it was my understanding that this specific suggestion would be dropped from the final draft of the resolution, which would instead only request Dr. Fredrickson to initiate a thorough study of the indirect cost issue. So the suggestion of reducing indirect cost allowances by 1/3 may have appeared in the final draft only because of an internal communication problem. In any event, it was only a suggestion of one possible course of action, and it was never intended as a final recommendation from this Council.

Following its unanimous adoption at the Oct. meeting, Dr. Duane subsequently withdrew his support from that resolution. Dr. Duane assures me that this was only because he feels uncertain about the final action which should be taken, an uncertainty that I am sure we all share, and that he still supports our initiative to re-examine this issue. Hence to my knowledge all members of this Council who were present at the Oct. 1979 meeting are still unanimously in support of the main thrust of this resolution.

Dr. Fredrickson has now received a number of letters from university administrators. Though these letters protested the suggested 1/3 cut of indirect costs, they dealt little, if at all, with the substantive issues of our resolution which make it important to re-examine indirect costs. Also, I am aware that faculty members at many universities are concerned about the rapid rise of indirect cost allowances in recent years. The basis of their concern is similar to ours, namely their perception that this has reduced funds available for direct research costs, with an attendant increase in the difficulty of obtaining adequate support for high quality research. But our resolution has not elicited letters from university faculty. This may be ascribed partly to the fact that people seldom write when they agree with your actions. Also, many faculty are understandably reluctant to visibly support actions that are opposed by administrators at their own universities, since they are dependent upon those administrators for many practical aspects of their careers and their work. In short, we have thus far heard only from university administrators on this issue. Though there is reason to believe that university faculty would support the main thrust of our Oct. resolution, it seems unlikely that their views on this subject will be as voluntarily and frankly offered as the views of university administrators.

In summary, events subsequent to our resolution have given no reason to doubt the importance of re-examining indirect cost allowances.

Preliminary budgetary analysis of the problem for NEI and NIH

Following the Nov. meet with Dr. Fredrickson, steps were taken by NEI, under Dr. Geller's direction, to develop some detailed figures on budgetary aspects of the increased indirect cost allowance over the period 1970-79. This analysis was intended to provide preliminary information, based upon data readily available to NEI, which would be helpful in assessing the magnitude of the problem that has developed. This information is summarized in charts provided to you before the meeting, and these charts are also enclosed as an addendum to these notes.

Chart 2 shows that for NEI, the percentage of total RO-1 grant funds that went into indirect costs increased from 23.4 to 29.2% over this nine-year period. Of course this meant that the percentage of total funds that went into direct costs declined from 76.6 to 70.8% over the same period. Some better idea of the impact of this upon direct cost funds may be gained by looking at absolute amounts. In 1979 the funds available for direct costs were about 50 million. But if the same percentage of total funds had been available for direct costs in 1979 as in 1970, that amount would have been about 54.2 million. In other words, the increased indirect cost allowance over that nine-year period appears to have reduced the funds available for direct costs in 1979 by more than 4 million dollars.

To what extent is NEI's problem an adequate sample of the overall problem of NIH? Chart 1 shows that the increased indirect cost allowance of NEI has been closely paralleled by the increased indirect cost allowance for NIH. In this chart the indirect cost allowance is expressed as a percentage of the direct costs. From 1970 to 1979 it increased from about 31 to 41% for NEI, while it increased from about 28.5 to 41% for NIH as a whole. Hence the increase for NIH as a whole has been somewhat greater, about 12.5% compared with 10% for NEI.

Again, some better idea of the impact upon NIH may be gained by looking at actual dollar amounts. I am informed that in fiscal 1979 the total funds budgeted for RO-1 grants in NIH as a whole were about 1409 million dollars. From information in Chart 1, it is readily calculated that only about 998 million of this was available for direct costs. But if the percentage indirect cost allowance had not increased from the 1970 level, it is calculated that about 1096 million would have been available in direct costs. So the increased percentage indirect cost allowance from 1970 to 1979 appears to have reduced the amount available to NIH for direct costs, in 1979 alone, by about 98 million dollars. It would seem that this is a useful index of the impact of increased indirect costs over this 9-year period upon the direct cost funds available to NIH.

It is also pertinent to see how the indirect cost allowance has increased at various universities during the period 1970-1979. This is shown in Charts 3-5 for nine of the top universities, based upon direct costs received from NEI funds in 1979. In three of these universities there was little or no increase. The other universities showed varying rates of increase, and in one case the increase was from 27 to 64% over the nine-year period. It should be noted that Charts 3-5 all express indirect costs as a percentage of the total direct costs. Although the basis upon which indirect costs are actually negotiated varies considerably between universities, these variations are eliminated as far as possible by expressing all indirect costs in a similar manner.

Because of the varying rates at which indirect cost allowances increased among universities in recent years, by 1979 there was a great spread of indirect cost allowances being applied at different universities. For those 9 universities shown in the charts, the spread in 1979 was from about 28 to 64%. But for all universities supported by NEI, Table 1 shows that the spread was from 15.4 to 90.3%. Of course this range means that in 1979 the percentage indirect cost allowance varied between universities by a factor of almost 6/1.

Some critical aspects of the indirect cost issue

Our preliminary budget analysis indicates that the percentage indirect cost allowance has increased rapidly in recent years, with increasingly severe consequences for direct costs of research supported by NEI and NIH. Also, the percentage indirect cost allowance has increased at widely varying rates in different universities, so that the percentage indirect cost allowance now varies greatly between universities. One fears that the high indirect cost allowances at some universities will now set precedents that some other universities will attempt to follow, thus contributing further to the upward spiral of the overall indirect cost allowance.

Since the indirect cost allowance is a percentage of the direct cost allowance, it should be noted that the funds available for indirect costs are automatically protected against inflation by the inflationary increase of direct costs. The demonstrated recent increases of the overall percentage indirect cost allowance might be justified if the inflationary factor applied to indirect costs should realistically be larger than that applied to direct costs. But all researchers know that direct research costs have been subject to exceptional inflation. Hence one wonders whether realistically the inflationary increase of direct costs has not exceeded the inflationary increase of indirect costs. If so, events of the recent past have been contrary to inflationary realities. Table 1 shows that for RO-1 grant funds awarded by NEI, the average direct costs per grant increased from 1970 to 1979 by 87%, while the average indirect costs per grant increased by 150% during the same period.

The percentage indirect cost allowance should also protect indirect cost funds against geographical variations of indirect costs, since one may expect these geographical variations to be similarly reflected in direct costs. Hence it is likewise difficult to understand the great variation of percentage indirect cost allowances between universities.

In trying to understand the basis of recent trends and their resultant problems for NIH, one cannot avoid the concern that they largely reflect the process whereby each university negotiates annually for its percentage indirect cost allowance for the coming year. Since no one negotiates similarly for direct costs as a percentage of the total budget, the direct costs are particularly vulnerable to reduction resulting from negotiated increases of indirect costs.

Though our preliminary budget data strongly support the need for a more thorough study of indirect costs, they give no clear indication of the causes of the trends that have been revealed. While some possibilities are apparent, a thorough study by accountants qualified to analyze indirect cost data might reveal additional factors that are not apparent to non-specialists in that field. In any event, NEI and NIH need answers to at least two important related questions. (1) Why has there been such a marked increase of the overall percentage indirect cost allowance in recent years? (2) Why has the percentage indirect cost allowance increased so rapidly at certain universities, while others have remained solvent and continued to conduct a great deal of research without requiring any increase of the percentage indirect cost allowance?

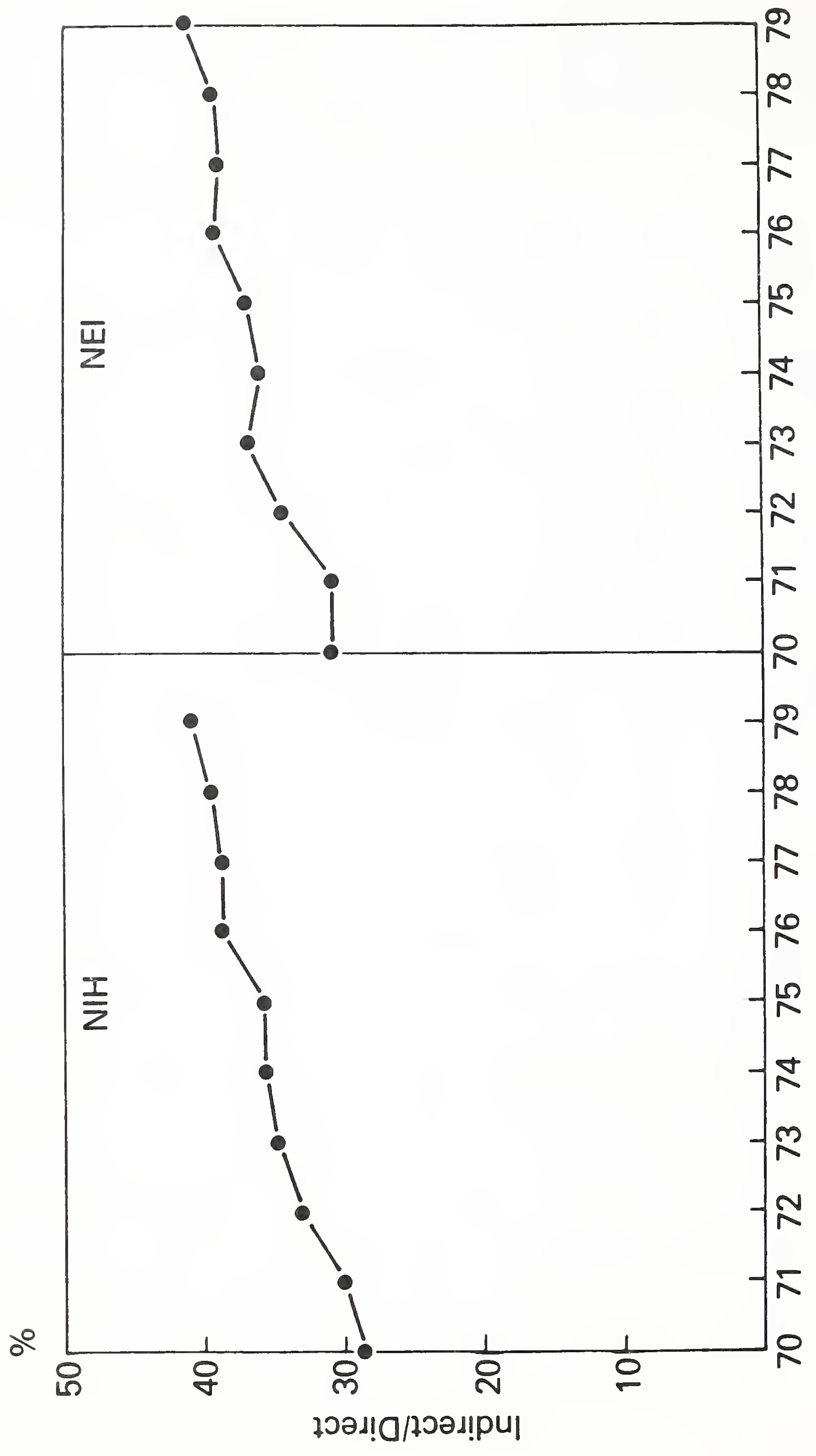
It would appear that a special problem with the indirect cost allowance is the absence of clearly defined built-in incentives for the universities themselves to keep indirect costs at a minimum. For direct costs each investigator has an incentive to make his budget sufficiently large to cover the needs of his project, but there is also an incentive to keep his budget as low as possible, since unduly expensive projects invite especially close scrutiny. A similar built-in balance of incentives seems desirable for indirect costs, but appears not to exist at the present time, since only direct costs are now considered in the evaluation of research proposals by Study Sections and Institute Councils. Looked at from a slightly different point of view, no incentive is apparent for universities to be cost-efficient with respect to the indirect costs of grant-supported research. In fact, the present system would almost seem to encourage inefficiency. For example, a university that pyramids its administrative costs of research could simply use those increased indirect costs in negotiating for a higher indirect cost allowance, and under current rules it appears that this could be done very successfully. Hence built-in incentives for the universities themselves to minimize indirect research costs, thus making their research programs as cost-efficient as possible, would seem highly desirable.

Another important issue concerns the consequences for our universities if indirect cost allowances were cut appreciably at this time. It appears that the total funds available to universities would stay about the same, but there would be less under indirect costs, while there would be proportionately more funds available to support the direct costs of research by the faculty. This would be greatly in the interests of NIH in its mission to support as much high quality research as possible. It would also be in the interests of the taxpayer, whose dollar would be buying more research, and in the interest of faculty members whose research was thereby supported. But these would be only short term advantages, which would be lost in the long term, if the solvency of our universities were seriously affected. There are some who predict such disasters. On the other hand, some university administrators are seriously concerned about becoming unduly dependent upon federal support. If this latter view has merit, reasonable limitation of the indirect cost allowance may also be in the long term interests of our universities. This is an important issue which cannot be answered here, but which should receive close attention in any final decision.

It is suggested that a thorough study of indirect costs could fruitfully address itself to at least the following five major problems. (1) Consideration of reducing the overall indirect cost allowance from current levels. (2) Consideration of reasonable and well defined limitations upon future increases of indirect cost allowances. (3) Consideration of steps aimed toward a more uniform treatment of universities with regard to indirect cost allowances. (4) Seek definition of a budgeting and grant-awarding process within which universities would have better defined built-in incentives to keep indirect costs of research at a minimum. (5) Seek an appropriate mechanism in the budgeting process to free direct cost funds from being vulnerable to decreases resulting from increases of the indirect cost allowance.

In summary, there are important reasons to reconsider the entire broad issue of indirect costs at this time. Well established trends already appear to have seriously eroded funds available for direct costs, and if unchecked it seems likely that this situation will become more serious in the near future. The amount of money involved is quite large, and there is no assurance that the problem will disappear without some form of positive action. Concern over this problem is widespread in the scientific community, especially since inflation and budgetary limitations are also posing serious problems for maintaining adequate funds to support the direct costs of research. I have noted widespread feelings that certain of the universities are largely responsible for this situation because of having sought and obtained unduly large indirect cost allowances. To whatever extent the true causes should prove otherwise, the universities themselves should welcome this information. Also, increasing dependence of many of our universities upon federal support must be viewed with alarm, and federal action may be called for to abate this trend, unless there is an explicit decision that such a growing dependence of our universities upon federal funds is either desirable or unavoidable. Since established trends may be contrary to the long term interests of all parties, re-examination of the issue may well produce decisions in the interests of all concerned. While decisions are needed as soon as possible, it is also critical that they should be based upon a very thorough study of the matter, with appropriate inputs from all interested parties.

Such a study would seem appropriate at the NIH level, so we would now respectfully solicit Dr. Fredrickson's response to this request.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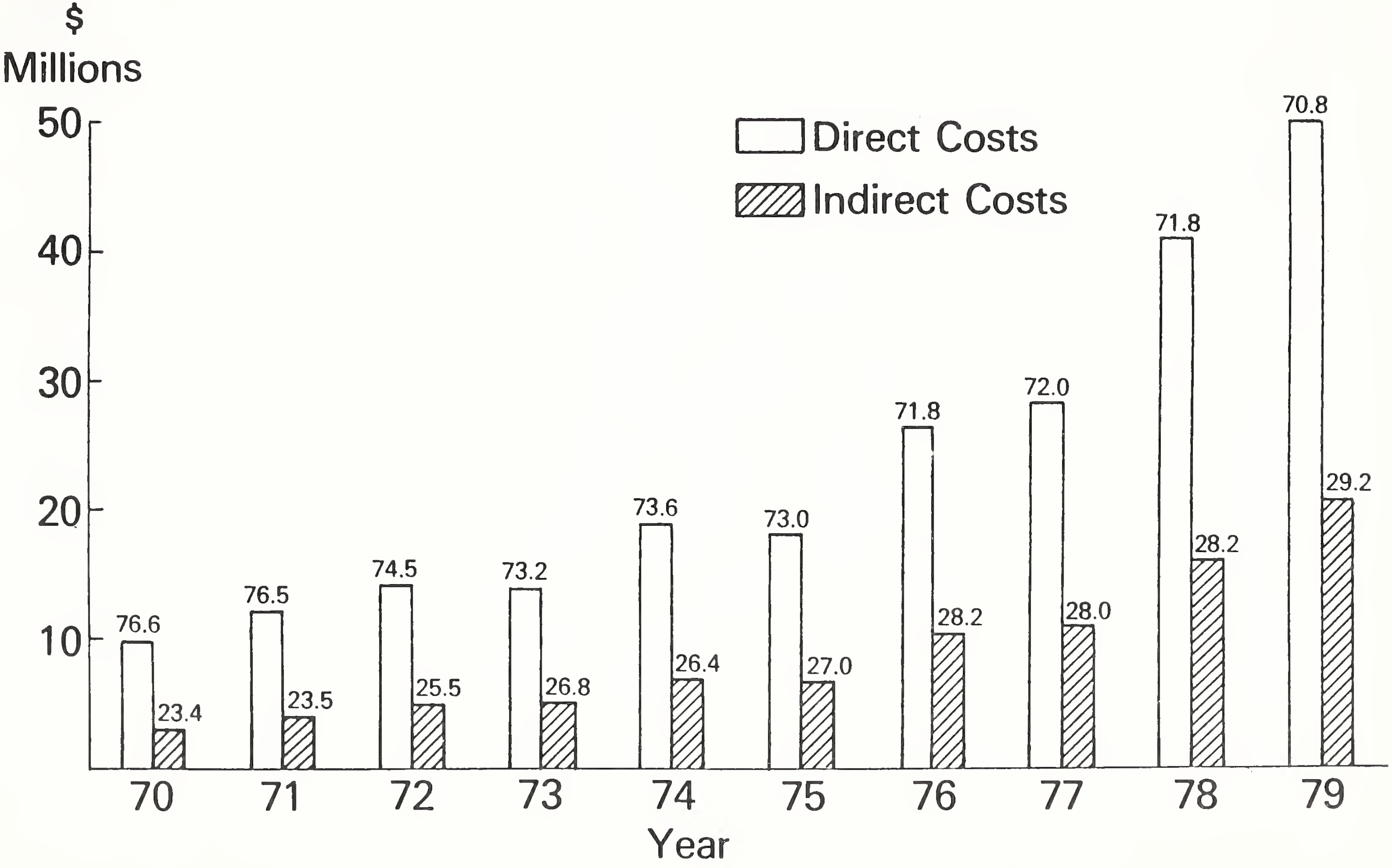
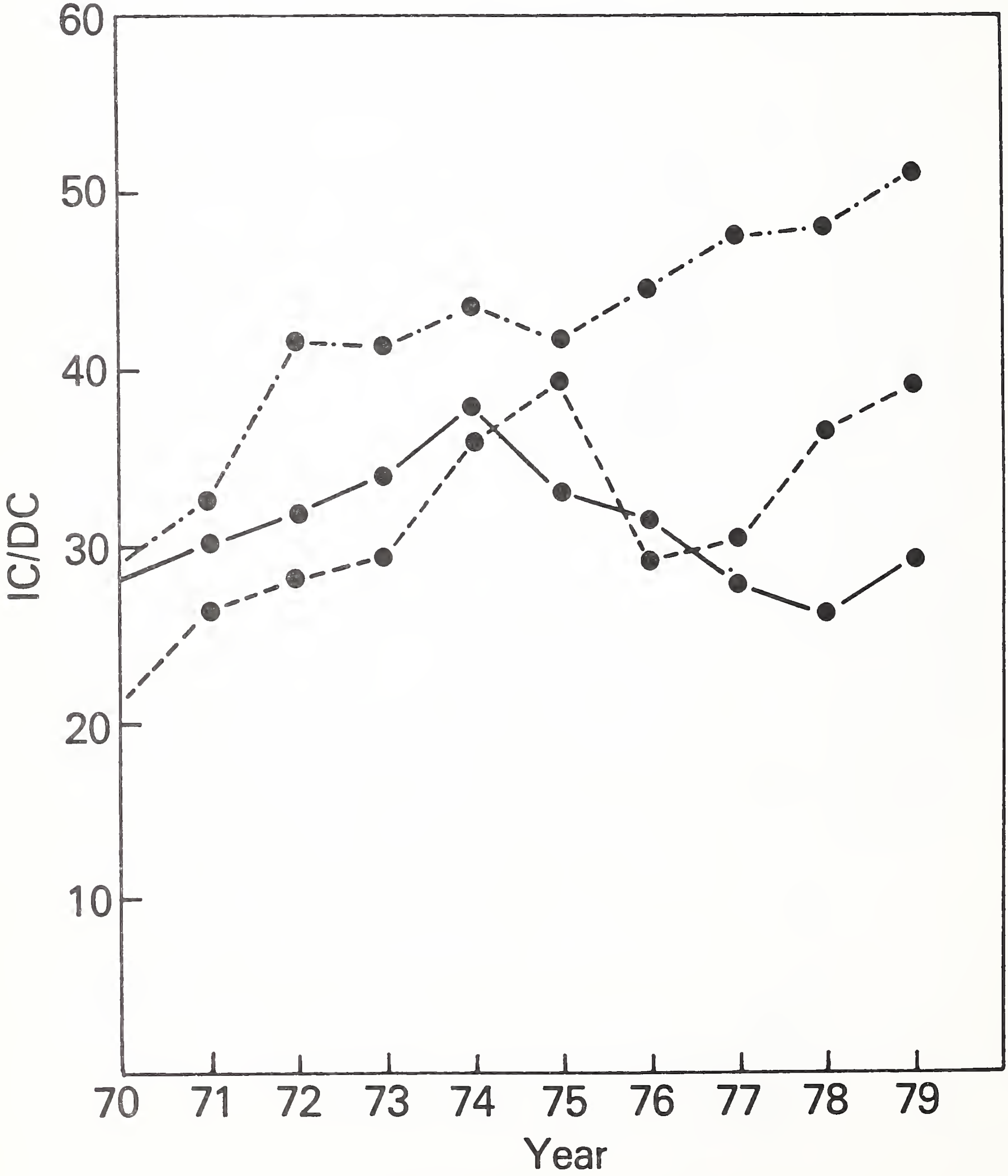
Year

CHART 2

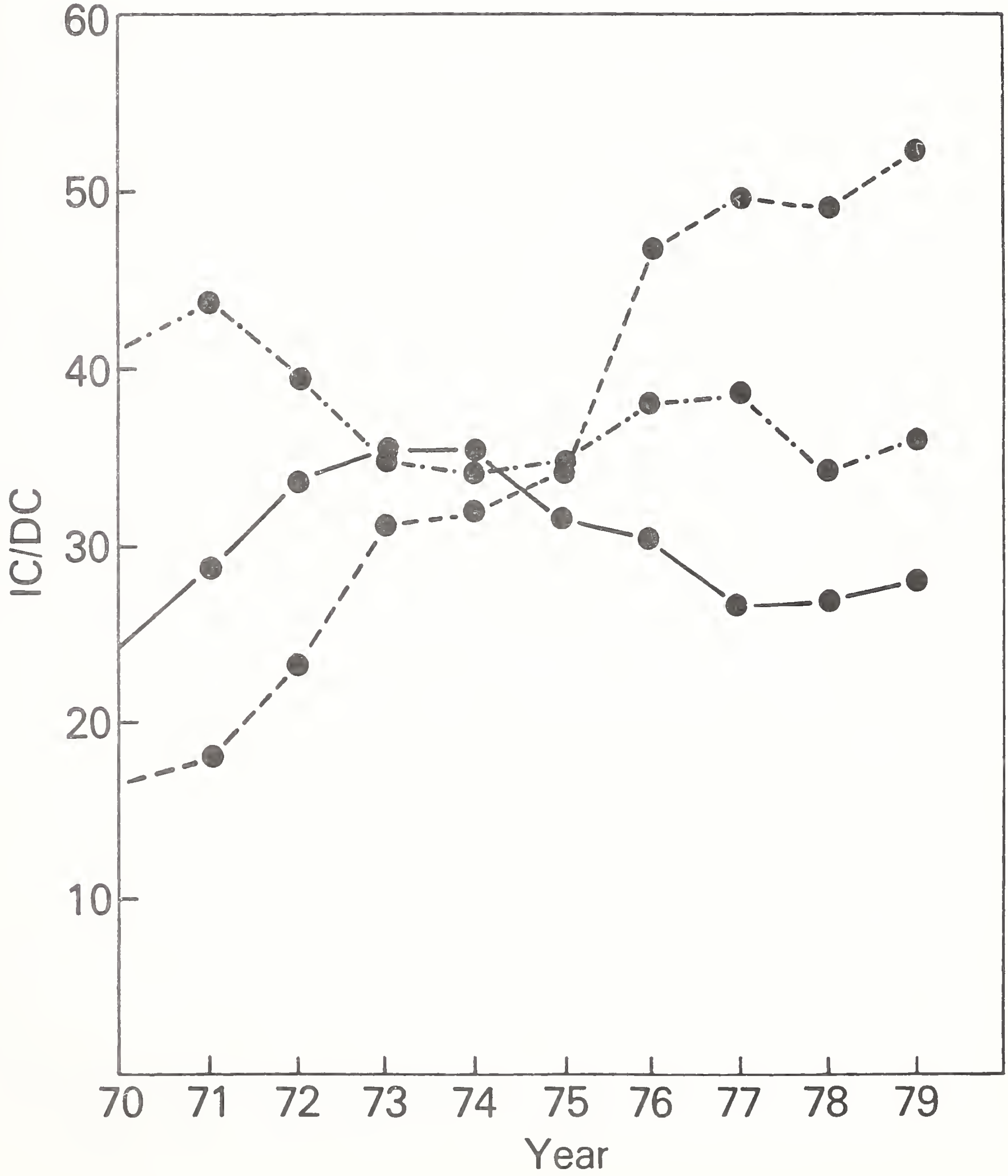
NATIONAL EYE INSTITUTE
PERCENT OF DIRECT AND INDIRECT TO TOTAL DOLLARS AWARDED (RO-1)



IC/DC RATIO OF TOP UNIVERSITIES RECEIVING NEI FUNDS IN 1979 (BASED ON DIRECT COSTS)



IC/DC RATIO OF TOP UNIVERSITIES RECEIVING NEI FUNDS IN 1979 (BASED ON DIRECT COSTS)



IC/DC RATIO OF TOP UNIVERSITIES RECEIVING NEI FUNDS IN 1979 (BASED ON DIRECT COSTS)

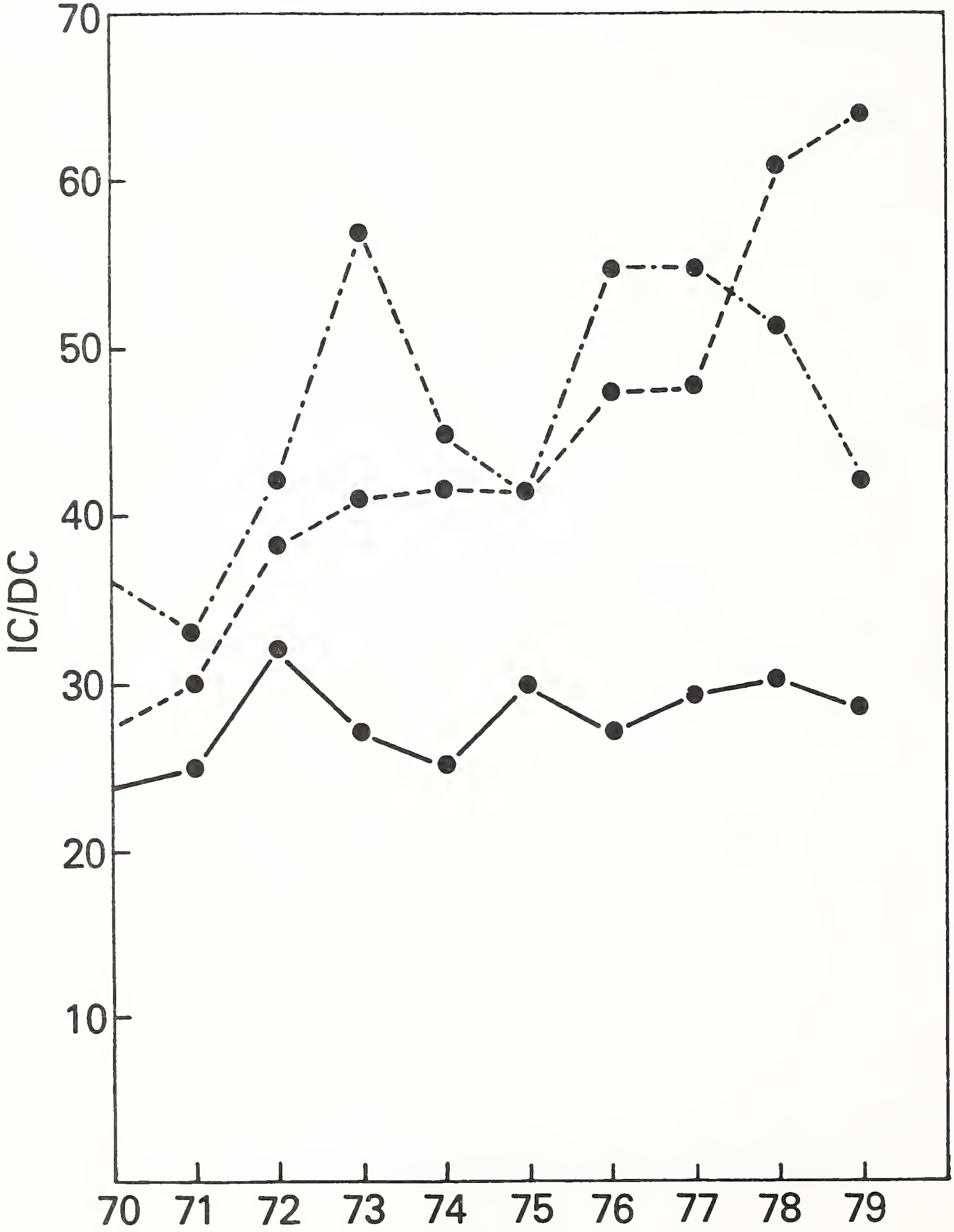


TABLE 1

DIRECT AND INDIRECT COSTS OF RO-1 GRANTS AWARDED BY NEI

	Direct Costs		Indirect Costs	
	Total	Cost per grant	Total	Cost per grant
FY 1970	$ 9,800,000	$27,700	$ 3,000,000	$ 8,700
FY 1979	49,900,000	51,700	20,600,000	21,800
% Increase	409	87	586	150

	IC/DC
FY 1970	31%
FY 1979	41%

NEI - Range of IC/DC Ratios (FY 1979)

71.6, 79.1, 90.3 (the 3 highest universities)

15.4, 17.4, 18.8 (the 3 lowest universities)

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January 1980

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Attachment E

INDIRECT COSTS: NEED FOR IMPROVEMENT IN GOVERNMENT UNIVERSITY COOPERATION

A recurring controversy in the relationship between universities and the Federal Government involves the treatment of indirect costs, i.e. those costs incurred in the performance of research activities and allocated to them on a defined but approximate basis because direct and precise assignment would demand prohibitive administrative costs. Although from the standpoint of accounting principles that allocation of such costs on carefully chosen bases which reasonably approximate the pertinent relationship is an entirely proper substitute for direct identification, misunderstandings about indirect costs abound, persist and unfairly impugn the integrity of those who claim reimbursement for these costs.

> Indirect costs are real costs; they are just as real and necessary as direct costs. The only difference between direct and indirect costs is the precision with which the costs can be specifically identified with a given activity.

The solution lies in controlling general inflationary pressures, assessing the cost-benefit ratios for the numerous fiscal, social and research accountability requirements imposed via federal laws and regulations, eliminating requirements that are not cost-effective and modifying necessary requirements so that criteria and results rather than detailed procedures or methods are specified.

The Cost Principles: Direct and Indirect Costs

Terminology and Key Technical Points

Cost principles - Circular A-21

Promulgated by the Office of Management and Budget, Executive Office of the President, these principles deal with the subject of cost determination, and make no attempt to identify the circumstances or dictate the extent of agency and institutional participation in the financing of a particular project. The Circular includes: definitions; basic considerations regarding cost determinations; methods (for assignment of indirect costs and for determination and application of indirect cost rates); general standards for selecting items of cost.

Direct costs

Direct costs are those costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity; or that can be directly assigned to such activities relatively easily with a high degree of accuracy.

Indirect costs

Indirect costs are those costs that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project, an instructional activity, or any other institutional activity.

Total costs

The costs of the sponsored agreement is comprised of the allowable direct costs incident to its performance, plus the allocable portion of the allowable indirect costs of the institution.

The basic approach

Indirect costs associated with or benefitting in some way a group of projects, programs or activities can equitably be prorated to a specific project in proportion to its size in relation to the size of all affected projects. This approach is based on recognized accounting principles and uses average costing, not incremental costing.

Indirect cost rate

The indirect cost rate is the ratio that the total of the indirect costs bears to some appropriate distribution base, for example total costs or salaries and wages. The indirect cost rate formula can therefore be summarized as follows:

$$\frac{\text{Total indirect costs applicable to organized research}}{\text{Total direct salaries and wages applicable to organized research}} = \text{Indirect Cost Rate (\%)}$$

Calculation of the indirect cost rate

The first step in the process of calculating the rate is to distinguish between the direct and indirect activities of the institution, and to categorize the associated expenditures accordingly. Once the indirect costs are isolated, they are grouped into homogeneous cost pools. These cost pools generally contain the following types of expense:

Use allowances or depreciation of buildings and equipment

Operations and maintenance of physical plant

General administration and general expenses

Departmental administration expenses

Research administration expenses

Student administration and services

Library

This initial grouping of costs entails in-depth analyses and surveys to obtain cost data. In developing indirect cost pools, universities must eliminate certain unallowable costs which under A-21 the Federal government does not reimburse. (For example interest expense, fund raising and investment management expense, independent research and development.) In addition to these specifically unallowable costs, other criteria for allowability of costs are that they be reasonable, allocable to government research contracts and grants, treated consistently according to accepted accounting principles, and that they conform to any limitations or exclusions that may be associated with a specific contract or grant.

Having identified the indirect costs, and grouped them with similar functions into indirect costs pools, they are then allocated among each of three (or more) direct cost objectives: instruction, organized research, and other institutional activities. This step is required because only those indirect costs which are attributable to research can be recovered from the Federal government.

Finally the indirect costs allocated to research must be distributed to individual research contracts and grants. The indirect costs are distributed to individual projects using a single distribution base. In most cases, the distribution base is either research direct salaries and wages, or modified total research direct costs. The ratio of research indirect costs to the research base represents the indirect cost rate. The rate is applied uniformally to all organized research projects, whether Federally funded or not, to determine the maximum amount of such costs which are allocable to sponsored research projects. The distribution of indirect costs to individual projects can be summarized as follows:

Indirect Cost Rate x Project Salaries = Project Indirect Costs

Notwithstanding the agreement on the essential objectives of the Federal cost principles, over the years they have repeatedly been the focus of concern. For example:

(a) The process which the Federal cost principles provide for indirect cost determination and rate calculation is based on a recognized accounting principle which allows use of an averaging method for the assessment of costs which can not be precisely attributed to a specific objective. Despite the legitimacy of this underlying principle, many individuals, including some university faculty, agency program officers, and Congressional staff are suspicious of indirect costs and refuse to accept them as real costs. Furthermore, many of these individuals do not understand that only those costs which demonstrably benefit sponsored research are included in the indirect cost rate determination. Instead they erroneously assume that universities are charging unrelated costs to the government through the vehicle of indirect cost rates.

(b) The increases in indirect cost rates in recent years have been a source of considerable concern and have led some to propose the imposition of limitations on the rates in order to control costs. Few have understood that the factors causing the increase in rates lie, for the most part, outside the universities' control. For example, the federally mandated social legislation (rise in social security tax, affirmative action, environmental impact legislation, occupational safety and health legislation, etc.) led to increased administrative costs some of which were properly allocable to sponsored research, and therefore increased indirect cost rates. Other factors are rising utility costs, inflationary factors which affected indirect cost elements somewhat more heavily than direct cost elements, increased grant and contract administrative requirements, and institutions' increased diligence in computing and justifying indirect costs. Only the last factor lies within institutional control. As the volume of Federally sponsored research has increased over the years, the impact of the aggregate has become more noticeable and institutions have understandably become more sophisticated and diligent in their attempts to recover the costs they incur in support of such research projects.

(c) The variation in indirect cost rates among institutions, although quite appropriate as a result of the application of the Federal cost principles,* has also been a source of considerable misunderstanding. Some individuals erroneously assume that the indirect cost rate is a measure of cost effectiveness. Others, particularly those who do not recognize the reality of indirect costs, assume the rate is negotiable like a fee or profit. Few realize that the rate is the result of detailed cost analyses, which support a rate proposal audited and negotiated with a Federal audit agency. Curiously, the indirect costs of industry and non-profit organizations which serve as government grantees and contractors are more readily accepted.

Certain characteristics of universities and of the process by which research is supported complicate and occasionally strain the relationship between the government and the universities. For example:

1) The existence of a joint product environment in which it is impossible to achieve accounting precision

2) The wide variation among institutions in their missions and organizational structures, and the management and accounting systems which reflect these differences

3) A system of support for research composed of multiple, discrete "procurements" by separate Federal agencies from individual institutions without provision for the underlying health of the research enterprise and the institutional base on which it depends

Exacerbating these difficulties are rising costs, a mounting total investment, general economic stresses, an apparent reduction of confidence in institutions throughout the society, and pressing short term needs in such areas as energy, health and the environment.

Attachment F

25 April 1980, Volume 208, Number 4442

SCIENCE

AMERICAN ASSOCIATION FOR
THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

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Diversion of Funds from Research

The various components of the federal government act with what they believe to be laudable intentions. But the cumulative effect of their actions is often a poor result. Important examples are the bureaucratization of the universities and a related severe injury to academic research. An ever-increasing share of monies ostensibly appropriated for research is being creamed off by university administrators to support federally mandated or inspired bureaucracies. The fraction of the grant funds actually devoted to research is in many instances two-thirds or less.

At one time, federal support of research was provided with a minimum of federal stipulations and the result was world leadership. But after they were hooked on federal dollars, most university administrators, with the notable exception of Kingman Brewster, did not have the wit and courage to protest when Congress held research grants hostage to social and other legislation. Today, 59 different federal laws and regulations such as fair employment practices affect the cost or conduct of research. Agents of the federal government can threaten a cutoff of federal funds if their whims are not catered to. The university bureaucracies use the real or implied threat of the feds to enhance their own power and status on campus and to expand their already swollen ranks. During a period when the number of professors was being held constant at many universities, the administrative complement increased threefold or more.

Diversion of funds hits aspiring young scholars most severely. Many of them cannot obtain research support. Young researchers who do obtain a grant must spend an inordinate amount of time coping with the paper work. Top-rank professors who hold large grants or contracts fare better, but at a cost. They are sufficiently well supported that they can minimize the impact of the bureaucrats. A practice they often follow is to create their own counterbureaucracy. Thus the slim research dollar is further attenuated. This practice helps to reduce routine annoyances, but it does not eliminate deleterious effects of the downgrading of the status of research.

Recently I canvassed a cross section of leading research professors around this country. The consensus was that despite their favored position, they were finding it harder and more time-consuming to achieve objectives. One veteran with a long record of notable accomplishments soberly estimated that the time required by his group to complete a substantial project had doubled. He had recently spent some months in West Germany and had found to his dismay that tasks there were being accomplished with the kind of verve and effectiveness that at one time characterized efforts in this country. Other professors noted that many of the best young people were leaving academia without advanced degrees and that a brain drain of established investigators to industry and to other countries was picking up momentum.

The impairment of academic research is a process that both Democratic and Republican administrations have contributed to. In its budget cuts the Carter administration has been relatively solicitous of research. However, the Office of Management and Budget, which is the President's servant, is proceeding with its demands for unrealistic accountablity embodied in its revision of the A-21 regulations. Politicians and bureaucrats in Washington seem not to realize that perfect time and effort accountability is a costly delusion. The bean counters drain off funds, spawn a bureaucracy, destroy morale, and hinder progress of research. They do not seem to understand that for research to be vital, creativity must take precedence over highly detailed bookkeeping.

University presidents who are close to what is happening and who have a responsibility to take constructive action have been relatively inert. If they would act in concert and marshal their alumni, their political clout would be enormous. Instead, they temporize. Ultimately the scientists will have to engage in cooperative political effort both on and off campus.

—Philip H. Abelson

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Attachment G

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Grant No. EY 00468-20 Title: Neurophysiology of the Vertebrate Retina

Budget proposed and approved for year 6/1/79-5/31/80

Direct Costs	
Personnel (Salaries plus fringe benefits)	
Principal Investigator (partial)	$25,665
Assistant Research Physiologists (1.5)	38,678
Specialist	31,572
Staff Research Associate	19,038
	114,953
Equipment	
Computer tape interface	3,800
Supplies	
Animals and animal care	8,529
Electronic and optical parts	2,690
Small laboratory instruments	1,200
Chemicals, glassware, photographic supplies, miscellaneous	3,420
	15,839
Travel (domestic)	2,800
Other	
Electronic shop services	5,613
Machine shop services	5,901
Secretarial services	6,276
Reprints	800
	18,590
Total Direct Costs	$155,982

Indirect Costs	%TDC	
Maintenance and Operation of Plant	4.68	$7,122
Building Use Allowance	1.32	2,009
Equipment Use Allowance	1.56	2,374
General Administration	7.55	11,490
Libraries	1.16	1,765
Departmental Administration	12.11	18,429
Student Services	2.62	3,987
Total Indirect Costs	31.00	$47,176
Total Budget (Direct plus Indirect Costs)		$203,158

NIH CRITIQUE OF OMB CIRCULAR A-21

Attachment H

Significant Changes in Cost Principles for Educational Institutions

A. Time or Effort Reporting/Support for Direct Personal Services Costs

Changes

For professional personnel, reporting requirements have been relaxed. Previous requirements for monthly effort certification have been replaced by options to (1) account for total salaried effort once each academic period (quarter, semester, etc.), or (2) identify total salaried effort and related salaries with workload categories (research projects, etc.) in advance and charge salaries accordingly unless significant changes in work effort occur during academic year (Monitored Workload option).

For nonprofessional personnel, total salaried effort must be accounted for on a monthly basis. Monitored Workload option cannot be used to accounting for nonprofessional effort.

Impact of Changes on Universities and/or NIH

Because the Monitored Workload option cannot be used for nonprofessionals, most Universities will probably adopt a system that accounts for professional effort once each academic period.

University faculty are disappointed that they will not be able to avail themselves of the less stringent reporting requirements under the Monitored Workload option.

B. Definition of Organized Research for Allocation of Indirect Costs

Change

Definition has been expanded to indicate that "the costs of organized research and development activities include all costs incurred by the institution in performing these activities." The OMB interpretation of this additional language will require institutions to identify voluntary cost sharing effort of professional personnel and related salaries with organized research for the purpose of developing an indirect cost rate for organized research.

Impact of Change on Universities and/or NIH

The assignment of direct costs of voluntary cost sharing to organized research will force universities to now cost share certain indirect costs (Operation and Maintenance expenses, etc.) applicable to direct costs of voluntary cost sharing. This change and its effect on universities' recovery of indirect cost may cause some institutions to begin charging NIH projects with salaries that were formerly cost-shared on a voluntary basis - a change that may significantly increase the cost of supporting biomedical research.

C. Cost Transfers

Change

There was virtually no change in the language prohibiting most cost transfers even though the incidence of significant audit exceptions involving cost transfers between related projects seemed to call for some additional language addressing the allowability of transfers between related projects.

Impact on Universities and/or NIH

Departmental interpretation papers refer to DHEW GAM Chapter 6-05 (Cost Transfers) in responding to expressions of concern in this area. While the Chapter does deal with transfers between closely related projects, it does not enumerate the criteria for determinations of "closely relatedness," nor does it indicate whether transfers of overruns between closely related projects are allowable notwithstanding the applicable prohibitions in C.4.b. of A-21.

D. Costs of Specialized Service Facilities

Change

Revised language makes it clear that costs of specialized service facilities chargeable to users of those facilities will include both direct costs and all allocable indirect costs. Prior to this change, most universities had recovered the space and utility costs (indirect costs) associated with these facilities through application of negotiated indirect cost rates for research to recoverable base costs (direct costs) of research projects.

Impact of Change on Universities and/or NIH

Some NIH B/I/D's (e.g., Division of Research Resources) are concerned that this will make the costs of utilizing these facilities, particularly animal care centers, prohibitive. For example, increases in the costs of animal care facilities may cause significant users to seek outside locations for care of animals or attempt to care (in violation of standards for Care and Treatment of Laboratory Animals) for the animals in their own laboratories - all with potentially harmful effects on the accomplishment of research objectives.

Additionally, because of the change in distribution bases for organized research indirect costs from Direct Salaries and Wages to Modified Total Direct Costs (MDTC) and the inclusion of the fully burdened cost of specialized service facilities in the MTDC base (under the category of "Services"), there will be little in the way of offsetting benefits (e.g., reduced indirect cost rates) to significant users of specialized service facilities.

E. Tuition Remission for Graduate Students

Change

Tuition remission for graduate students working on research grants was formerly treated by the majority of universities as an allocated fringe benefit, i.e., as part of a fringe benefit rate applicable to all professional employees. The revised cost principles refer to tuition remission as a form of compensation paid to students as, or in lieu of, salaries and wages, and require that such costs be charged to projects in accordance with percentages of effort expended on those projects. This change has effectively required universities to (1) specifically identify tuition remission with the graduate student and the projects that he/she works on based on effort allocations, or (2) develop average rates for tuition remission recoveries only and assign amounts (resulting from use of rates) to projects based on effort allocations.

Impact of Change on Universities and/or NIH

For those universities that formerly allocated tuition remission for graduate students as part of an overall fringe benefit rate, this change will generally result in committed direct costs for remainder of grant project periods to be inadequate to absorb specifically identified tuition remission for graduate students working on the grants. Accordingly, NIH B/I/D's will encounter, and are now encountering, numerous requests for administrative increases - increases that will further erode funds available for support of new research initiatives.

Consideration of the aforementioned administrative increases has identified an additional problem. B/I/D Health Scientist Administrators and Grants Management Officers are now beginning to question the reasonableness of funding a graduate student's salary for 50% effort (on a full time equivalent basis) plus 100% of the graduate student's tuition that has been remitted by the University.

F. Limitation on Indirect Cost Recoveries by Universities

Change

The revised cost principles would appear to prohibit DHEW's imposition of an 8% TDC ceiling on recovery of indirect costs under research training grants.

Impact of Change on Universities and/or NIH

It is estimated that removal of the 8% TDC limitation would increase the cost of NIH's annual support of research training by approximately thirty-three million dollars.

Because this increase cannot be readily absorbed by NIH or other DHEW program agencies, the Department intends to ask OMB for a formal deviation to permit continued imposition of this administrative limitation.

federal register

TUESDAY, MARCH 6, 1979
PART III

OFFICE OF MANAGEMENT AND BUDGET

CIRCULAR A-21

Cost Principles For Educational Institutions

OFFICE OF MANAGEMENT AND BUDGET

CIRCULAR A-21—COST PRINCIPLES FOR EDUCATIONAL INSTITUTIONS

This notice revises Federal Management Circular 73-8. It will be renumbered OMB Circular No. A-21. The revision originated from recommendations made by the Department of Health, Education, and Welfare after urging by the House and Senate Appropriations Committees.

On March 10, 1978, the Office of Management and Budget published a proposed revision in the FEDERAL REGISTER for comment. In response to the publication, we received approximately 300 letters from Members of Congress, Federal agencies, university administrators, faculty members, professional associations, and members of the public.

There follows a summary of the major comments grouped by subject, and a response to each, including a description of any changes made as a result of the comment. In addition to the changes described specifically, other changes have been made to improve clarity, readability, and precision; and to reduce the burden of compliance as much as possible.

For further information, contact Mr. John J. Lordan, Chief, Financial Management Branch, Office of Management and Budget, New Executive Office Building, 726 Jackson Place, N.W., Washington, D.C. 20503, (202) 395-6823.

PURPOSE

Comment. Several commentators pointed out that the proposed revision contained too much detail, and that it seemed to establish cost accounting procedures and instructions, rather than cost accounting principles.

Response. In our opinion, the revision does not change the fundamental nature of the Circular. It provised for more consistent treatment of costs, and clarifies many provisions that were considered too vague and which left the way open to widely varying interpretations. This subject is covered in more detail below in specific comments on other sections of the Circular.

Comment. Several commentators had a favorable reaction to the provision which says that agencies are not expected to place additional restrictions on individual items of cost.

Response. This provision remains in the Circular.

APPLICABILITY

Comment. Several commentators agreed with the provision which extends regulations of the Cost Accounting Standards Board to federally funded research and development centers operated by universities. This was a coordinated action with the CASB, which has exempted other work at universities from coverage.

Response. This provision remains in the Circular.

EFFECTIVE DATE

Comment. Several commentators pointed out the need for adequate time for implementation. Some suggested a two-year transition period.

Response. The Circular now establishes an effective date of October 1, 1979, and says that implementation will begin in the institution's first fiscal year beginning after that date. This can be speeded up or extended with the agreement of the cognizant Federal agency. We would expect this provision to be used to assure an orderly phase in of new provisions such as the accounting for tuition remission and specialized service facilities.

DEFINITION OF TERMS

Comment. Many commentators stated that "other sponsored activities" should not include agricultural extension programs, which had been cited as an example.

Response. This example has been removed from the Circular and we are now studying a request to exempt this program from coverage by the Circular.

INDIRECT COSTS

Comment. Many commentators objected to the inclusion of a standard allocation method to be used for each of the categories of indirect cost.

Response. The Circular has been revised to more clearly state that the standard allocation method is used only in the absence of a cost analysis study, or a mutual agreement between the institution and the cognizant agency on use of a different method.

Comment. Several commentators argued that it was inequitable to allocate depreciation on certain capital improvements on a standard base of unweighted headcount of students and employees.

Response. The unweighted headcount base has been replaced by a full-time equivalent base.

Comment. As proposed, the modified total direct cost base consisted of salaries and wages, fringe benefits, materials and supplies, travel, and subgrants and subcontracts up to $5,000 each. Several commentators proposed an increase in the dollar level of subgrants and subcontracts. Suggestions ranged from $10,000 to $50,000.

Response. The amount has been raised to $25,000.

Comment. A number of commentators objected to the use of the number of sponsored agreements as the standard base for allocating the costs of sponsored projects administration.

Response. The standard allocation base has been changed to modified total direct costs.

LIBRARY EXPENSES

Comment. Many commentators objected to the unweighted headcount base for allocating library expenses.

Response. The unweighted headcount base has been changed to the full-time equivalent base.

STUDENT ADMINISTRATION AND SERVICES

Comment. Several commentators objected that the Circular would not recognize student administration and service costs as applicable to the sponsored agreements. They contended that these services benefit all students, including those employed by the institution.

Response. The standard base for allocating student service costs would call for allocation to the instruction function, and subsequently to any sponsored agreement in that function.

DETERMINATION AND APPLICATION OF INDIRECT COSTS OR RATES

Comment. Several commentators objected to the use of modified total direct cost as the standard base for allocating indirect costs to sponsored agreements.

Response. The definition has been modified to include all subgrants and subcontracts up to $25,000 each.

COMPENSATION FOR PERSONAL SERVICES

Comment. Several commentators objected to the frequency of personnel activity reports.

Response. Compared to present requirements, frequency has been reduced from monthly to once an academic term. Also, the Circular has been clarified to explain that employees whose salaries and wages are not charged direct, or not involved in the distribution of indirect costs would not be included in the reporting system.

Comment. Several commentators criticized applying the monitored workload system only to professional employees.

Response. Introducing the monitored workload concept for professional employees recognizes that their activities cannot be measured with the same degree of accuracy as nonprofessionals. We believe that the monitored workload alternative represents a good balance between reducing paperwork and achieving an acceptable level of accountability.

DEPRECIATION AND USE ALLOWANCES

Comment. Several commentators stated that the requirement for a physical equipment inventory every two years was burdensome.

Response. The two-year inventory requirement remains. However, it has been clarified to recognize that statistical sampling techniques may be used in making the inventory. We believe an institution wishing to recover depreciation or use allowances on equipment must take the normal business precaution of assuring by physical inventory that the equipment is still on hand.

EQUIPMENT AND OTHER CAPITAL EXPENDITURES

Comment. Many commentators recommeded that the definition of equipment be changed from an acquisition cost of $300 and a useful life of more than one year. The most common suggestion was $500 and a useful life of more than two years.

Response. The Circular has been amended to define equipment as tangible personal property having a useful life of more than two years and an acquisition cost of $500 or more per unit.

SCHOLARSHIPS AND STUDENT AID COSTS

Comment. Some commentators objected to the provision that tuition remission for student employees be treated as a direct charge to sponsored agreements.

Response. The Circular would not prohibit tuition remission as an indirect cost in all cases. It would require that tuition remission be treated as a direct or indirect cost in accordance with the actual work being performed. This is consistent with the general rules stated earlier in the Circular and with basic principles of cost accounting.

Comment. Some commentators stated that the tuition remission provision would discriminate against out-of-state students. Since the tuition they would ordinarily pay at State universities is higher than that of in-state students, their remission would be higher, thereby encouraging research faculty to favor in-state graduate assistants.

Response. The Circular has been modified to permit tuition remission to be charged on an average rate basis.

SPECIALIZED SERVICE FACILITIES

Comment. Many commentators objected to the inclusion of "animal resources centers" as a specialized service facility.

Response. "Animal resource centers" has been deleted as an example, but may be treated as a specialized service facility as circumstances dictate at each institution.

Comment. Many commentators cited the possibility that including indirect costs in the charges for specialized service facilities might raise the apparent cost of the services to such a high level that research faculty would decline to use them. They also cited unique situations where it might be appropriate to recover less than the full cost of a specialized service facility.

Response. The Circular provides that normally charges for these services should include both direct and indirect costs. It allows for exclusion of indirect costs where not material in amount.

VELMA N. BALDWIN,
Assistant to the Director for Administration.

EXECUTIVE OFFICE OF THE PRESIDENT,
OFFICE OF MANAGEMENT AND BUDGET,
Washington, D.C., February 26, 1979.

[Circular No. A-21, Revised]

To the Heads of Executive Departments and Establishments.

Subject: Cost principles for educational institutions.

1. *Purpose.* This circular establishes principles for determining costs applicable to grants, contracts, and other agreements with educational institutions. The principles deal with the subject of cost determination, and make no attempt to identify the circumstances or dictate the extent of agency and institutional participation in the financing of a particular project. The principles are designed to provide that the Federal Government bear its fair share of total costs, determined in accordance with generally accepted accounting principles, except where restricted or prohibited by law. Agencies are not expected to place additional restrictions on individual items of cost. Provision for profit or other increment above cost is outside the scope of this Circular.

2. *Supersession.* The Circular supersedes Federal Management Circular 73-8, dated December 19, 1973. FMC 73-8 is revised and reissued under its original designation of OMB Circular No. A-21.

3. *Applicability.*

a. All Federal agencies that sponsor research and development, training, and other work at educational institutions shall apply the provisions of this Circular in determining the costs incurred for such work. The principles shall also be used as a guide in the pricing of fixed price or lump sum agreements.

b. In addition, Federally Funded Research and Development Centers associated with educational institutions shall be required to comply with the Cost Accounting Standards, rules and regulations issued by the Cost Accounting Standards Board, and set forth in 4 CFR Ch. III; provided that they are subject thereto under defense related contracts.

4. *Responsibilities.* The successful application of cost accounting principles requires development of mutual understanding between representatives of educational institutions and of the Federal Government as to their scope, implementation, and interpretation.

5. *Attachment.* The prinicples and related policy guides are set forth in the Attachment, "Principles for determining costs applicable to grants, contracts, and other agreements with educational institutions."

6. *Effective date.* The provisions of this Circular shall be effective October 1, 1979. The provisions shall be implemented by institutions as of the start of their first fiscal year beginning after that date. Earlier implementation, or a delay in implementation of individual provisions, is permitted by mutual agreement between an institution and the cognizant Fedral agency.

7. *Inquiries.* Further information concerning this Circular may be obtained by contacting the Financial Management Branch, Budget Review Division, Office of Management and Budget, Washington, D.C. 20503, telephone (202) 395-6823.

JAMES T. MCINTYRE, JR.,
Director.

PRINCIPLES FOR DETERMINING COSTS APPLICABLE TO GRANTS, CONTRACTS, AND OTHER AGREEMENTS WITH EDUCATIONAL INSTITUTIONS

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PRINCIPLES FOR DETERMINING COSTS APPLICABLE TO GRANTS, CONTRACTS, AND OTHER AGREEMENTS WITH EDUCATIONAL INSTITUTIONS

A. PURPOSE AND SCOPE

1. *Objective.* This Attachment provides principles for determning the costs applicable to research and development, training, and other sponsored work performed by colleges and universities under grants, contracts, and other agreements with the Federal Government. These agreements are referred to as sponsored agreements.

2. *Policy guides.* The successful application of these cost accounting principles requires development of mutual understanding between representatives of universities and of the Federal Government as to their scope, implementation, and interpretation. It is recognized that—

a. The arrangements for Federal agency and institutional participation in the financing of a research, tranining, or other project are properly subject to negotiation between the agency and the institution concerned, in accordance with such Government-wide criteria or legal requirements as may be applicable.

b. Each institution, possessing its own unique combination of staff, facilities, and experience, should be encouraged to conduct research and educational activities in a manner consonant with its own academic philosophies and institutional objectives.

c. The dual role of students engaged in research and the resulting benefits to sponsored agreements are fundamental to the research effort and shall be recognized in the application of these principles.

d. Each institution, in the fulfillment of its obligations, should employ sound management practices.

e. The application of these cost accounting principles should require no significant changes in the generally accepted accounting practices of colleges and universities. However, the accounting practices of individual colleges and universities must support the accumulation of costs as required by the principles, and must provide for adequate documentation to support costs charged to sponsored agreements.

f. Cognizant Federal agencies involved in negotiating indirect cost rates and auditing should assure that institutions are generally applying these cost accounting principles on a consistent basis. Where wide variations exist in the treatment of a given cost item among institutions, the reasonableness and equitableness of such treatments should be fully considered during the rate negotiations and audit.

3. *Application.* These principles shall be used in determining the allowable costs of work performed by colleges and universities under sponsored agreements. The principles shall also be used in determining the costs of work performed by such institutions under subgrants, cost-reimbursement subcontracts, and other awards made to them under sponsored agreements. They also shall be used as a guide in the pricing of fixed-price contracts and subcontracts where costs are used in determining the appropriate price. The principles do not apply to:

a. Arrangements under which Federal financing is in the form of loans, scholarships, fellowships, traineeships, or other fixed amounts based on such items as education allowance or published tuition rates and fees of an institution.

b. Capitation awards.

c. Other awards under which the institution is not required to account to the Government for actual costs incurred.

B. DEFINITION OF TERMS

1. *Major functions of an institution* refers to instruction (includes departmental research), organized research, other sponsored activities, and other institutional activities as defined below:

a. *Instruction* means the teaching and training activities of an institution. Except for research training as provided in c below, this term includes all teaching and training activities, whether they are offered for credits toward a degree or certificate or on a noncredit basis, and whether they are offered through regular academic departments or separate divisions, such as summer school division or an extension division.

b. *Departmental research* means all research and development activities that are not organized research and, consequently, are not separately budgeted and accounted for. Departmental research, for purposes of this document, is not considered as a major function of an institution but as a part of the instruction function of the institution.

c. *Organized research* means all research and development activities of an institution that are separately budgeted and accounted for. This term includes research and development activities that ase sponsored by Federal and non-Federal agencies and organizations, as well as those that are separately bedgeted by the institution under an internal allocation of institutional funds. It also includes activities involving the training of individuals in research techniques (commoly called research training) where such activities utilize the same facilities as other research and development activities, and where such activities are not included in the instruction function. The costs of organized research and development activities include all costs incurred by the institution in performing the activities.

d. *Other sponsored activities* means programs and projects financed by Federal and non-Federal agencies and organizations which involve the performance of work other than instruction and organized research. Examples of such programs and projects are health service projects, and community service programs. However, when any of these activities are undertaken by the institution without outside support, they may be classified as other institutional activities.

e. *Other institutional activities* means all activities of an institution except: (1) instruction, departmental research, organized research, and other sponsored activities, as defined above; (2) indirect cost activities identified in Section F; and (3) specialized service facilities described in Section J38. Other institutional activities include operation of residence halls, dining halls, hospitals and clinics, student unions, intercollegiate athletics, bookstores, faculty housing, student apartments, guest houses, chapels, theaters, public museums, and other similar auxiliary enterprises. This definition also includes any other categories of activities, costs of which are "unallowable" to sponsored agreements, unless otherwise indicated in the agreements.

2. *Sponsored agreement,* for purposes of this circular, means any grant, contract, or other agreement between the institution and the Federal Government.

3. *Allocation* means the process of assigning a cost, or a group of costs, to one or more cost objective, in reasonable and realistic proportion to the benefit provided or other equitable relationship. A cost objective may be a major function of the institution, a particular service or project, a sponsored agreement, or an indirect cost activity, as described in Section F. The process may entail assigning a cost(s) directly to a final cost objective or through one or more intermediate cost objectives.

C. BASIC CONSIDERATIONS

1. *Composition of total costs.* The cost of a sponsored agreement is comprised of the allowable direct costs incident to its performance, plus the allocable portion of the allow-

able indirect costs of the institution, less applicable credits as described in 5 below.

2. *Factors affecting allowability of costs.* The tests of allowability of costs under these principles are: (a) they must be reasonable; (b) they must be allocable to sponsored agreements under the principles and methods provided herein; (c) they must be given consistent treatment through application of those generally accepted accounting principles appropriate to the circumstances; and (d) they must conform to any limitations or exclusions set forth in these principles or in the sponsored agreement as to types or amounts of cost items.

3. *Reasonable costs.* A cost may be considered reasonable if the nature of the goods or services acquired or applied, and the amount involved therefor, reflect the action that a prudent person would have taken under the circumstances prevailing at the time the decision to incur the cost was made. Major considerations involved in the determination of the reasonableness of a cost are: (a) whether or not the cost is of a type generally recognized as necessary for the operation of the institution or the performance of the sponsored agreement; (b) the restraints or requirements imposed by such factors as arm's-length bargaining, Federal and State laws and regulations, and sponsored agreement terms and conditions; (c) whether or not the individuals concerned acted with due prudence in the circumstances, considering their responsibilities to the institution, it employees, it students, the Government, and the public at large; and (d) the extent to which the actions taken with respect to the incurrence of the cost are consistent with established institutional policies and practices applicable to the work of the institution generally, including sponsored agreements.

4. *Allocable costs.*

a. A cost is allocable to a particular cost objective (i.e., a specific function, project, sponsored agreement, department, or the like) if the goods or services involved are chargeable or assignable to such cost objective in accordance with relative benefits received or other equitable relationship. Subject to the foregoing, a cost is allocable to a sponsored agreement if (1) it is incurred solely to advance the work under the sponsored agreement; (2) its benefits both the sponsored agreement and other work of the institution, in proportions that can be approximated through use of reasonable methods, or (3) it is necessary to the overall operation of the institution and, in light of the principles provided in this Circular, is deemed to be assignable in part to sponsored projects. Where the purchase of equipment or other capital items is specifically authorized under a sponsored agreement, the amounts thus authorized for such purchases are assignable to the sponsored agreement regardless of the use that may subsequently be made of the equipment or other capital items involved.

b. Any costs allocable to a particular sponsored agreement under the standards provided in this Circular may not be shifted to other sponsored agreements in order to meet deficiencies caused by overruns or other fund considerations, to avoid restrictions imposed by law or by terms of the sponsored agreement, or for other reasons of convience.

5. *Applicable credits.*

a. The term applicable credits refers to those receipts or negative expenditures that operate to offset or reduce direct or indirect cost items. Typical examples of such transactions are: purchase discounts, rebates, or allowances; recoveries or indemnites on losses; and adjustments of overpayments or erroneous charges. This term also includes "educational discounts" on products or services provided specifically to educational institutions, such as discounts on computer equipment, except where the arrangement is clearly and explicitly identified as a gift by the vendor.

b. In some instances, the amounts received from the Federal Government to finance institutional activities or service operations should be treated as applicable credits. Specifically, the concept of netting such credit items against related expenditures should be applied by the institution in determining the rates or amounts to be charged to sponsored agreements for services rendered whenever the facilities or other resources used in providing such services have been financed directly, in whole or in part, by Federal funds. (See Sections F8, J9a, and J38 for areas of potential application in the matter of direct Federal financing.)

6. *Costs incurred by State and local governments.* Costs incurred or paid by State or local governments on behalf of their colleges and universities for fringe benefit programs such as pension costs and FICA and any other costs specifically incurred on behalf of, and in direct benefit to, the institutions are allowable costs of such institutions whether or not these costs are recorded in the accounting records of the institutions, subject to the following:

a. The costs meet the requirements of C1 through 5 above.

b. The costs are properly supported by cost allocation plans in accordance with applicable Federal cost accounting principles.

c. The costs are not otherwise borne directly or indirectly by the Federal Government.

7. *Limitations on allowance of costs.* Sponsored agreements may be subject to statutory requirements that limit the allowance of costs. When the maximum amount allowable under a limitation is less than the total amount determined in accordance with the principles in this Circular, the amount not recoverable under a sponsored agreement may not be charged to other sponsored agreements.

D. DIRECT COSTS

1. *General.* Direct costs are those costs that can be identified specifically with a particular sponsored project, and instructional activity, or any other institutional activity; or that can be directly assigned to such activities relatively easily with a high degree of accuracy.

2. *Application to sponsored agreements.* Identification with the sponsored work rather than the nature of the goods and services involved is the determining factor in distinguishing direct from indirect costs of sponsored agreements. Typical costs charged directly to a sponsored agreement are the compensation of employees for performance of work under the sponsored agreement, including related fringe benefit costs to the extent they are consistently treated, in like circumstances, by the institution as direct rather than indirect costs; the costs of materials consumed or expended in the performance of the work; and other items of expense incurred for the sponsored agreement, including extraordinary utility consumption. The cost of materials supplied from stock or services rendered by specialized facilities or other institutional service operations may be included as direct costs of sponsored agreements, provided such items are consistently treated, in like circumstances, by the institution as direct rather than indirect costs, and are charged under a recognized method of computing actual costs, and conform to generally accepted cost accounting practices consistently followed by the institution.

E. INDIRECT COSTS

1. *General.* Indirect costs are those that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project, and instructional activity, or any other institutional activity. At educational institutions such costs normally are classified under the following indirect cost categories: depreciation and use allowances, general administration and general expenses, sponsored projects administration expenses, operation and maintenance expenses, library expenses, departmental administration expenses, and student administration and services.

2. *Criteria for distribution.*

3. *Base period.* A base period for distribution of indirect costs is the period during which the costs are incurred. The base period normally should coincide with the fiscal year established by the institution, but in any event the base period should be so selected as to avoid inequities in the distribution of costs.

b. *Need for cost groupings.* The overall objective of the indirect cost allocation process is to distribute the indirect costs described in Section F to the major functions of the institution in proportions reasonably consistent with the nature and extent of their use of the institution's resources. In order to achieve this objective, it may be necessary to provide for selective distribution by establishing separate groupings of cost within one or more of the indirect cost categories referred to in E1 above. In general, the cost groupings established within a category should constitute, in each case, a pool of those items of expense that are considered to be of like nature in terms of their relative contribution to (or degree of remoteness from) the particular cost objectives to which distribution is appropriate. Cost groupings should be established considering the general guides provided in c below. Each such pool or cost grouping should then be distributed individually to the related cost objectives, using the distribution base or method most appropriate in the light of the guides set forth in d below.

c. *General considerations on cost groupings.* The extent to which separate cost groupings and selective distribution would be appropriate at an institution is a matter of judgment to be determined on a case-by-case basis. Typical situations which may warrant the establishment of two or more separate cost groupings (based on account classification or analysis) within an indirect cost category include but are not limited to the following:

(1) Where certain items or categories of expense relate solely to one of the major functions of the institution or to less than all functions, such expenses should be set aside as a separate cost grouping for direct assignment or selective allocation in accordance with the guides provided in E2b and d.

(2) Where any types of expense ordinarily treated as general administration or departmental administration are charged to sponsored agreements as direct costs, expenses applicable to other activities of the institution when incurred for the same purposes in like circumstances must, through separate cost groupings, be excluded from the indirect costs allocable to those sponsored agreements and included in the direct cost of other activities for cost allocation purposes.

(3) Where it is determined that certain expenses are for the support of a service unit or facility whose output is susceptible of measurement on a workload or other quantitative basis, such expenses should be set aside as a separate cost gouping for distribution on such basis to organized research, instructional, and other activities at the institution or within the department.

(4) Where activities provide their own purchasing, personnel administration, building maintenance or similar service, the distribution of general administration and general espenses, or operation and maintenance expenses to such activities should be accomplished through cost groupings which include only that portion of central indirect costs (such as for overall management) which are properly allocable to such activities.

(5) Where the institution elects to treat fringe benefits as indirect charges, such costs should be set aside as a separate cost grouping for selective distribution to related cost objectives.

(6) The number of separate cost groupings within a category should be held within practical limits, after taking into consideration the materiality of the amounts involved and the degree of precision attainable through less selective methods of distribution.

d. *Selection of distribution method.*

(1) Actual conditions must be taken into account in selecting the method or base to be used in distributing individual cost groupings. The essential consideration in selecting a base is that it be the one best suited for assigning the pool of costs to cost objectives in accordance with benefits derived; a traceable cause and effect relationship; or logic and reason, where neither benefit nor cause and effect relationship is determinable.

(2) Where a cost grouping can be identified directly with the cost objective benefited, it should be assigned to that cost objective.

(3) Where the expenses in a cost grouping are more general in nature, the distribution may be based on a cost analysis study which results in an equitable distribution of the costs. Such cost analysis studies may take into consideration weighting factors, population, or space occupied if appropriate. Cost analysis studies, however, must (a) be appropriately documented in sufficient detail for subsequent review by the cognizant Federal agency, (b) distribute the costs to the related cost objectives in accordance with the relative benefits derived, (c) be statistically sound, (d) be performed specifically at the institution at which the results are to be used, and (e) be reviewed periodically, but not less frequently than every two years, updated if necessary, and used consistently. Any assumptions made in the study must be stated and explained. The use of cost analysis studies and periodic changes in the method of cost distribution must be fully justified.

(4) If a cost analysis study is not performed, or if the study does not result in an equitable distribution of the costs, the distribution shall be made in accordance with the appropriate base cited in Section F., unless one of the following conditions is met: (a) it can be demonstrated that the use of a different base would result in a more equitable allocation of the costs, or that a more readily available base would not increase the costs charged to sponsored agreements, or (b) the institution qualifies for, and elects to use, the simplified method for computing indirect cost rates described in Section H.

e. *Order of Distribution.*

(1) Indirect cost categories consist of depreciation and use allowance, operation and maintenance, general administration and general expenses, departmental administration, sponsored projects administration, library, and student administration and services, as described in Section F.

(2) Depreciation and use allowances, operation and maintenance expenses, and general administrative and general expenses should be allocated in that order to the remaining indirect cost categories as well as to the major functions and specialized service facilities of the institution. Other cost categories may be allocated in the order determined to be most appropriate by the institutions. When cross allocation of costs is made as provided in (3) below, this order of allocation does not apply.

(3) Normally an indirect cost category will be considered closed once it has been allocated to other cost objectives, and costs may not be subsequently allocated to it. However, a cross allocation of costs between two or more indirect cost categories may be used if such allocation will result in a more equitable allocation of costs. If a cross allocation is used, an appropriate modification to the composition of the indirect cost categories described in Section F is required.

F. IDENTIFICATION AND ASSIGNMENT OF INDIRECT COSTS

1. *Depreciation and use allowances.*

a. The expenses under this heading are the portion of the costs of the institution's buildings, capital improvements to land and buildings, and equipment which are computed in accordance with Section J9.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be allocated in the following manner:

(1) Depreciation or use allowances on buildings used exclusively in the conduct of a single function, and on capital improvements and equipment used in such buildings, shall be assigned to that function.

(2) Depreciation or use allowances on buildings, used for more than one function, and on capital improvements and equipment used in such buildings, shall be allocated to the individual functions performed in each building on the basis of usable square feet of space, excluding common areas such as hallways, stairwells, and restrooms.

(3) Depreciation or use allowances on buildings and capital improvements where space is used jointly, and on equipment used jointly, shall be allocated to benefiting functions in proportion to the total salaries and wages applicable to the joint functions.

(4) Depreciation or use allowances on buildings, capital improvements, and equipment used predominantly for one function and only incidentally for other(s), may be assigned to the function in which it is used predominantly.

(5) Depreciation or use allowances on certain capital improvements to land, such as paved parking areas, fences, sidewalks, and the like, not included in the cost of buildings, shall be allocated to user categories of students and employees on a full-time equivalent basis. The amount allocated to the student category shall be assigned to the instruction function of the institution. The amount allocated to the employee category shall be further allocated to the major functions of the institution in proportion to the salaries and wages of all employees applicable to those functions.

2. *Operation and maintenance expenses.*

a. The expenses under this heading are those that have been incurred by a central service organization or at the departmental level for the administration, supervision, operation, maintenance, preservation, and protection of the institution's physical plant. They include expenses normally incurred for such items as janitorial and utility services; repairs and ordinary or normal alterations of buildings, furniture and equipment; and care of grounds and maintenance and operation of buildings and other plant facilities. The operation and maintenance expenses category should also include the fringe benefit costs applicable to the salaries and wages included therein, and depreciation and use allowance.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be allocated in the same manner as described in Section F1b for depreciation and use allowances.

3. *General administration and general expenses.*

a. The expenses under this heading are those that have been incurred for the general executive and administrative offices of educational institutions and other expenses of a general character which do not relate solely to any major function of the institution; i.e., solely to (1) instruction, (2) organized research, (3) other sponsored activities, or (4) other institutional activities. The general administration and general expense category should also include the fringe benefit costs applicable to the salaries and wages included therein, an appropriate share of operation and maintenance expense, and depreciation and use allowances.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be grouped first according to common major functions of the institution to which they render services or provide benefits. The aggregate expenses of each group shall then be allocated to serviced or benefited functions on the modified total cost basis. Modified total costs consist of salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to $25,000 each. When an activity included in this indirect cost category provides a service or product to another institution or organization, an appropriate adjustment must be made to either the expenses or the basis of allocation or both, to assure a proper allocation of costs.

4. *Departmental administration expenses.*

a. The expenses under this heading are those that have been incurred for administrative and supporting services that benefit common or joint departmental activities or objectives in academic deans' offices, academic departments and divisions, and organized research institutes, study centers, and research centers. Departmental administration expenses are subject to the following limitations.

(1) Academic deans' offices. Salaries and operating expenses are limited to those attributable to administrative functions.

(2) Academic departments:

(a) The salaries of the heads of academic departments, divisions, and organized research units are limited to amounts attributable to their administrative duties. Salaries of professorial or professional staff, whose appointment or assignment require administrative work that benefits sponsored projects, may also be included to the extent that the portion so charged is clearly and specifically supported as required in Section J6.

(b) Other administrative and supporting expenses incurred within academic departments are allowable provided they are treated consistently in like circumstances. This would include expenses such as the salaries of secretarial and clerical staffs, the salaries of administrative officers and assistants, travel, office supplies, stockrooms, and the like.

(3) Other fringe benefit costs applicable to the salaries and wages included in (1) and (2) above are allowable, as well as an appropriate share of general administration and general expenses, operation and maintenance expenses, and depreciation and/or use allowances.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be allocated as follows:

(1) The administrative expenses of the dean's office of each college and school shall be allocated to the academic departments within that college or school on the modified total cost basis.

(2) The administrative expenses of each academic department, and the department's share of the expenses allocated in (1) above shall be allocated to the appropriate functions of the department on the modified total coast basis.

5. *Sponsored projects administration.*

a. The expenses under this heading are those that have been incurred by a separate organization(s) established primarily to administer sponsored projects, including such functions as grant and contract administration (Federal and Non-Federal), special security, purchasing, personnel administration, and editing and publishing of research and other reports. They include the salaries and expenses of the head of such organization, his assistants, and their immediate staff, together with the salaries and expenses of personnel engaged in supporting activities maintained by the organization, such as stock rooms, stenographic pools, and the like. The salaries of professorial or professional staff whose appointments or assignments involve the performance of such administrative work may also be included to the extent that the portion so charged to sponsored agreements administration is clearly identified and supported as required by Section J6. This category should also include the fringe benefit costs applicable to the salaries and wages included therein, an appropriate share of general administration and general expenses, the operation and maintenance expenses, and depreciation and use allowance. Appropriate adjustments should be made for services provided to other functions or organizations.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be allocated to the major functions of the institution under which the sponsored projects are conducted on the basis of the modified total cost of sponsored projects.

c. An appropriate adjustment shall be made to eliminate any duplicate charges to sponsored agreements when this category includes similar or identical activities as those included in the general administration and general expense category or other indirect cost items, such as accounting, procurement, or personnel administration.

6. *Library expenses.*

a. The expenses under this heading are those that have been incurred for the operation of the library, including the cost of books and library materials purchased for the library, less any items of library income that qualify as applicable credits under Section C5. The library expense category should also include the fringe benefits applicable to the salaries and wages included therein, an appropriate share of general administration and general expense, operation and maintenance expense, and depreciation and use allowances. Costs incurred in the purchases of rare books (museum-type books) with no value to sponsored agreements should not be allocated to them.

b. In the absence of the alternatives provided for in Section E2d, the expenses included in this category shall be allocated first on the basis of primary categories of users, including students, professional employees, and other users.

(1) The student category shall consist of full-time equivalent students enrolled at the institution, regardless of whether they earn credits toward a degree or certificate.

(2) The professional employee category shall consist of all faculty members and other professional employees of the institution, on a full-time equivalent basis.

(3) The other users category shall consist of all other users of library facilities.

c. Amounts allocated in b above shall be assigned further as follows: (1) The amount in the student category shall be assigned to the instruction function of the institution.

(2) The amount in the professional employee category shall be assigned to the major functions of the institution in proportion to the salaries and wages of all faculty members and other professional employees applicable to those functions.

(3) The amount in the other users category shall be assigned to the other institutional activities function of the institution.

7. *Student administration and services.*

a. The expenses under this heading are those that have been incurred for the administration of student affairs and for services to students, including expenses of such activities as deans of students, admissions, registrar, counseling and placement services, student advisers, student health and infirmary services, catalogs, and commencements and convocations. The salaries of members of the academic staff whose academic appointments or assignments involve the performance of such administrative or service work may also be included to the extent that the portion so charged is supported pursuant to Section J6. This expense category also includes the fringe benefit costs applicable to the salaries and wages included therein, an appropriate share of general administration and general expenses, operation and maintenance, and use allowances and/or depreciation.

b. In the absence of the alternatives provided for in Section E2d, the expenses in this category shall be allocated to the instruction function, and subsequently to sponsored agreements in that function.

8. *Offset for indirect expenses otherwise provided for by the Government.*

a. The items to be accumulated under this heading are the reimbursements and other payments from the Federal Government which are made to the institution to support solely, specifically, and directly, in whole or in part, any of the administrative or service activities described in F1 through 7 above.

b. The items in this group shall be treated as a credit to the affected individual indirect cost category before that category is allocated to benefiting functions.

G. DETERMINATION AND APPLICATION OF INDIRECT COST RATE OR RATES

1. *Indirect cost pools.*

a. Subject to b below, the separate categories of indirect costs allocated to each major function of the institution as prescribed in Section f shall be aggregated and treated as a common pool for that function. The amount in each pool shall be divided by the distribution base described in G2 below to arrive at a single indirect cost rate for each function. The rate for each function is used to distribute indirect costs to individual sponsored agreements of that function. Since a common pool established for each major function of the institution, a separate indirect cost rate would be established for each of the major functions described in Section B1 under which sponsored agreements are carried out.

b. In some instances a single rate basis for use across the board on all work within a major function at an institution may not be appropriate. A single rate for research, for example, might not take into account those different environmental factors and other conditions which may affect substantially the indirect costs applicable to a particular segment of research at the institution. A particular segment of research may be that performed under a single sponsored agreement or it may consist of research under a group of sponsored agreements performed in a common environment. The environmental factors are not limited to the physical location of the work. Other important factors are the level of the administrative support required, the nature of the facilities or other resources employed, the scientific disciplines or technical skills involved, the organizational arrangements used, or any combination thereof. Where a particular segment of a sponsored agreement is performed within an environment which appears to generate a significantly different level of indirect costs, provision should be made for a separate indirect cost pool applicable to such work. The separate indirect cost pool should be developed during the regular course of the rate determination process and the separate indirect cost rate resulting therefrom should be utilized: provided it is determined that (1) such indirect cost rate differs significantly from that which would have been obtained under a above, and (2) the volume of work to which such rate would apply is material in relation to other sponsored agreements at the institution.

2. *The distribution basis.* Indirect costs shall be distributed to applicable sponsored agreements on the basis of modified total direct costs, consisting of salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to $25,000 each. For this purpose, an indirect cost rate should be determined for each of the separate indirect cost pools developed pursuant to G1, above. The rate in each case should be stated as the percentage which the amount of the particular indirect cost pool is of the modified total direct costs identified with such pool. Other bases may be used where it can be demonstrated that they produce more equitable results.

3. *Negotiated lump sum for indirect costs.* A negotiated fixed amount in lieu of indirect costs may be appropriate for self-contained, off-campus, or primarily subcontracted activities where the benefits derived from an institution's indirect services cannot be readily determined. Such negotiated indirect costs will be treated as an offset before allocation to instruction, organized research, other sponsored activities, and other institutional activities. The base on which such remaining expenses are allocated should be appropriately adjusted.

4. *Predetermined fixed rates for indirect costs.* Public Law 87-638 (76 Stat. 437) authorizes the use of predetermined fixed rates in determining the indirect costs applicable under research agreements with educational institutions. The stated objectives of the law are to simplify the administration of cost-type research and development contracts (including grants) with educational institutions, to facilitate the preparation of their budgets, and to permit more expeditious closeout of such contracts when the work is completed. In view of the potential advantages offered by this procedure, consideration should be given to the negotiation of predetermined fixed rates for indirect costs in those situations where the cost experience and other pertinent facts available are deemed sufficient to enable the parties involved to reach an informed judgment as to the probable level of indirect costs during the ensuing accounting period.

5. *Negotiated fixed rates and carry-forward provisions.* When a fixed rate is negotiated in advance for a fiscal year (or other time period), the over- or under-recovery for that year may be included as an adjustment to the indirect cost for the next rate negotiation. When the rate is negotiated before the carry-forward adjustment is determined, the carry-forward amount may be applied to the next subsequent rate negotiation. When such adjustments are to be made, each fixed rate negotiated in advance for a given period will be computed by applying the expected indirect costs allocable to sponsored agreements for the forecast period plus or minus the carry-forward adjustment (over- or under-recovery) from the prior period, to the forecast distribution base. Unrecovered amounts under lump-sum agreements or cost-sharing provisions of prior years shall not be carried forward for consideration in the new rate negotiation. There must, however, be an advance understanding in each case between the institution and the cognizant Federal agency as to whether these differences will be considered in the rate negotiation rather than making the determination after the differences are known. Further, institutions electing to use this carry-forward provision may not subsequently change without prior approval of the cognizant Federal agency. In the event that an institution returns to a postdetermined rate, any over- or under-recovery during the period in which negotiated fixed rates and carry-forward provisions were followed will be included in the subsequent postdetermined rates. Where multiple rates are used, the same procedure will be applicable for determining each rate.

H. SIMPLIFIED METHOD FOR SMALL INSTITUTIONS

1. *General.*

a. Where the total direct cost of work covered by this Circular at an institution does not exceed $3,000,000 in a fiscal year, the use of the simplified procedure described in 2, below, may be used in determining allowable indirect costs. Under this simplified procedure, the institution's most recent annual financial report and immediately available supporting information with salaries and wages segregated from other costs, will be utilized as a basis for determining the indirect cost rate applicable to all sponsored agreements.

b. The simplified procedure should not be used where it produces results which appear inequitable to the Government or the institution. In any such case, indirect costs should be determined through use of the regular procedure.

2. *Simplified procedure.*

a. Establish the total amount of salaries and wages paid to all employees of the institution.

b. Establish an indirect cost pool consisting of the expenditures (exclusive of capital items and other costs specifically identified as unallowable) which customarily are classified under the following titles or their equivalents:

(1) General administration and general expenses (exclusive of costs of student administration and services, student activities, student aid, and scholarships).

(2) Operation and maintenance of physical plant; and depreciation and use allowances; after appropriate adjustment for costs applicable to other institutional activities.

(3) Library.

(4) Department administration expenses, which will be computed as 20 percent of the salaries and expenses of deans and heads of departments.

In those cases where expenditures classified under (1) above have previously been allocated to other institutional activities, they may be included in the indirect cost pool. The total amount of salaries and wages included in the indirect cost pool must be separately identified.

c. Establish a salary and wage distribution base, determined by deducting from the total of salaries and wages as established in a above the amount of salaries and wages included under b above.

d. Establish the indirect cost rate, determined by dividing the amount in the indirect cost pool, b above, by the amount of the distribution base, c above.

e. Apply the indirect cost rate to direct salaries and wages for individual agreements to determine the amount of indirect costs allocable to such agreements.

J. GENERAL PROVISIONS FOR SELECTED ITEMS OF COST

Sections 1 through 44 below provide principles to be applied in establishing the allowability of certain items involved in determining cost. These principles should apply irrespective of whether a particular item of cost is properly treated as direct cost or indirect cost. Failure to mention a particular item of cost is not intended to imply that it is either allowable or unallowable; rather determination as to allowability in each case should be based on the treatment provided for similar or related items of cost. In case of a discrepancy between the provisions of a specific sponsored agreement and the provisions below, the agreement should govern.

1. *Advertising costs.*

a. The term advertising costs means the costs of advertising media and corollary administrative costs. Advertising media include magazines, newspapers, radio and television programs, direct mail, exhibits, and the like.

b. The only advertising costs allowable are those which are solely for (1) the recruitment of personnel required for the performance by the institution of obligations arising under the sponsored agreement, when considered in conjunction with all other recruitment costs, as set forth in Section J32; (2) the procurement of goods and services for the performance of the sponsored agreement; (3) the disposal of scrap or surplus materials acquired in the performance of the sponsored agreement except when institutions are reimbursed for disposal costs at a predetermined amount in accordance with Attachment N, OMB Circular No. A-110; or (4) other specific purposes necessary to meet the requirements of the sponsored agreement.

c. Costs of this nature, if incurred for more than one sponsored agreement or for both sponsored work and other work of the institution, are allowable to the extent that the principles in Sections D and E are observed.

2. *Bad debts.* Any losses, whether actual or estimated, arising from uncollectible accounts and other claims, related collections costs, and related legal costs, are unallowable.

3. *Civil defense costs.* Civil defense costs are those incurred in planning for, and the protection of life and property against, the possible effects of enemy attack. Reasonable costs of civil defense measures (including costs in excess of normal plant protection costs, first-aid training and supplies, firefighting training, posting of additional exit notices and directions, and other approved civil defense measures) undertaken on the institution's premises pursuant to suggestions or requirements of civil defense authorities are allowable when distributed to all activities of the institution. Capital expenditures for civil defense purposes will not be allowed, but a use allowance or depreciation may be permitted in accordance with provisions set forth in Section J9. Costs of local civil defense projects not on the institution's premises are unallowable.

4. *Commencement and convocation costs.* Costs incurred for commencements and convocations are unallowable, except as provided for in Section F7.

5. *Communication costs.* Costs incurred for telephone services, local and long distance telephone calls, telegrams, radiograms, postage and the like, are allowable.

6. *Compensation for personal services*

a. *General.* Compensation for personal services covers all amounts paid currently or accrued by the institution for services of employees rendered during the period of performance under sponsored agreements. Such amounts include salaries, wages, and fringe benefits (See Section J15.). These costs are allowable to the extent that the total compensation to individual employees conforms to the established policies of the institution, consistently applied, and provided that the charges for work performed directly on sponsored agreements and for other work allocable as indirect costs are determined and supported as provided below. Charges to sponsored agreements may include reasonable amounts for activities contributing and intimately related to work under the agreements, such as delivering special lectures about specific aspects of the ongoing activity, writing reports and articles, participating in appropriate seminars, consulting with colleagues and graduate students, and attending meetings and conferences. Incidental work (that in excess of normal for the individual), for which supplemental compensation is paid by an institution under institutional policy, need not be included in the payroll distribution systems described below, provided such work and compensation are separately identified and documented in the financial management system of the institution.

b. *Payroll distribution.* For each organizational unit of an institution, the distribution of salaries and wages of professorial or professional staff (whether charged direct or required to be distributed to more than one activity for purposes of allocating indirect costs) will be based on either a system of monitored workload or a system of personnel activity reports. The latter system will be used for nonprofessional employees whose costs are charged direct or are required to be distributed to more than one activity for purposes of allocating indirect costs. In the use of either method, it is recognized that, because of the nature of work involved in academic institutions, the various and often interrelated activities of professorial and professional employees frequently cannot be measured with a high degree of precision, that reliance must be placed on reasonably accurate approximations, and that acceptance of a degree of tolerance in measurement is appropriate.

c. *Monitored workload.* Under this method the distribution of salaries and wages applicable to sponsored agreements is based on budgeted or assigned workload, updated to reflect any significant changes in workload distributions. A monitored workload system used for salaries and wages charged directly or indirectly to sponsored agreements will meet the following standards:

(1) A system of budgeted or assigned workload will be incorporated into the official records of the institution and encompass both sponsored and all other activities on an integrated basis. The system may include the use of subsidiary records.

(2) The system will reasonably reflect workload of employees, accounting for 100 percent of the work for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution. Because practices vary among institutions and within institutions as to the total activity constituting a full workload—when expressed in measurable units, such as contact hours in teaching—the system will be based on a determination for each individual, reflecting the ratio of each of the activities which comprise the total workload of the individual. (But see Section H for treatment of indirect costs under the simplified method for small institutions.)

(3) The system will provide for modification of an individual's salary or salary distribution commensurate with any significant change in the employee's workload or the ratio of activities comprising the total workload. A significant change in an employee's workload shall be considered to include the following as a minimum: when work begins or ends on a sponsored agreement, when a teaching load is materially modified, when additional unanticipated assignments are received or taken away, when an individual begins or ends a sabbatical leave, prolonged sick leave, or leave without pay, etc. Short-term (such as one or two months) fluctuation between workload categories need not be considered as long as the distribution of salaries and wages is reasonable over the longer term such as an academic period. Whenever it is apparent that a change in workload will occur or has occurred, the change will be documented over the signature of a responsible offical and, if significant, entered into the system.

(4) The system will utilize workload categories reflecting activity which is applicable to each sponsored agreement, each indirect cost activity, and each major function of the institution.

(5) At least annually a statement will be signed by the employee, principal investigator, or responsible official, having first hand knowledge of the work stating that salaries and wages charged to sponsored agreements as direct charges, or that salaries and wages charged to both direct and indirect cost categories, or to more than one indirect cost category are reasonable.

(6) The system will provide for independent internal evaluations to insure that it is working effectively.

(7) In the use of this method an institution shall not be required to provide additional support or documentation for the effort actually performed, but is responsible for assuring that the system meets the above standards.

d. *Personnel activity reports.* Under this system the distribution of salaries and wages will be supported by personnel activity reports as prescribed below.

(1) Personnel activity reports will reflect the distribution of activity expended by each employee covered by the system.

(2) The reports will reflect an after-the-fact reporting of the percentage of activity of each employee. Charges may be made initially on the basis of estimates made before the services are performed, provided that such charges are promptly adjusted if significant differences are indicated by activity reports.

(3) Each report will account for 100 percent of the activity for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution. The report will reasonable reflect the percentage of activity applicable to each sponsored agreement, each indirect cost category, and each major function of the institution.

(4) To confirm that the distribution of activity represents a reasonable estimate of the work performed by the employee during the period, each report will be signed by the employee or by a responsible official having first hand knowledge of the work performed.

(5) For professorial and professional staff, the reports will be prepared each academic term, but no less frequently than every six months. For other individuals, the reports will be prepared no less frequently than monthly and will coincide with one or more pay periods.

(6) Where the institution uses time cards or other forms of after-the-fact payroll documents as original documentation for payroll and payroll charges, such documents shall qualify as a personnel activity report provided that they are meet the requirements in (1) through (5) above.

e. *Salary rates for faculty members.*

(1) *Salary rates for academic year.* Charges for work performed on sponsored agreements by faculty members during the academic year will be based on the individual faculty member's regular compensation for the continuous period which, under the policy of the institution concerned, constitutes the basis of his salary. Charges for work performed on sponsored agreements during all or any portion of such period are allowable at the base salary rate. In no event will charges to sponsored agreements, irrespective of the basis of computation, exceed the proportionate share of the base salary for that period. This principle applies to all members of the faculty at an institution. Since intra-university consulting is assumed to be undertaken as a university obligation requiring no compensation in addition to full-time base salary, the principle also applies to faculty members who function as consultants or otherwise contribute to a sponsored agreement conducted by another faculty member of the same institution. However, in unusual cases where consultation is across departmental lines or involves a separate or remote operation, and the work performed by the consultant is in addition to his regular departmental load, any charges for such work representing extra compensation above the base salary are allowable provided that such consulting arrangements are specifically provided for in the agreement or approved in writing by the sponsoring agency.

(2) *Periods outside the accdmeic year.*

(a) Except as otherwise specified for teaching activity in (b) below, charges for work performed by faculty members on sponsored agreements during the summer months or other period not included in the base salary period will be determined for each faculty member at a rate not in excess of the base salary divided by the period to which the base salary relates, and will be limited to charges made in accordance with other parts of this section. The base salary period used in computing charges for work performed during the summer months will be the number of months covered by the faculty member's official academic year appointment.

(b) Charges for teaching activities performed by faculty members on sponsored agreements during the summer months or other periods not included in the base salary period will be based on the normal policy of the institution governing compensation to faculty members for teaching assignments during such periods.

(3) *Pat-time faculty.* Charges for work performed on sponsored agreements by faculty members having only part-time appointments will be determined at a rate not in excess of that regularly paid for the part-time assignments; e.g., an institution pays $5,000 to a faculty member for half-time teaching during the academic year. He devoted one-half of his remaining time to a sponsored agreement. Thus, his additional compensation, chargeable by the institution to the agreement, would be one-half of $5,000, or $2,500.

f. *Noninstitutional professional activities.* Unless an arrangement is specifically authorized by a Federal sponsoring agency, an institution must follow its institution-wide policies and practices concerning the permissible extent of professional services that can be provided outside the institution for noninstitutional compensation. Where such institution-wide policies do not exist or do not adequately define the permissible extent of consulting or other noninstitutional activities undertaken for extra outside pay, the Government may require that the effort of professional staff working on sponsored agreements be allocated between (1) institutional activities, and (2) noninstitutional professional activities. If the sponsoring agency considers the extent of noninstitutional professional effort excessive, appropriate arrangements governing compensation will be negotiated on a case-by-case basis.

7. *Contingency provisions.* Contributions to a contingency reserve or any similar provision made for events, the occurrence of which cannot be foretold with certainty as to time, intensity, or with an assurance of their happening, are unallowable. (But see also Section J16c.)

8. *Deans of faculty and graduate schools.* The salaries and expenses of deans of faculty and graduate schools, or their equivalents, and their staffs, are allowable.

9. *Depreciation and use allowances.* Institutions may be compensated for the use of their buildings, capital improvements, and equipment; provided that they are used, needed in the institutions' activities, and properly allocable to sponsored agreements. Such compensation shall be made by computing either depreciation or use allowance. Use allowances are the means of providing such compensation when depreciation or other equivalent costs are not computed. The allocation for depreciation or use allowance shall be made in accordance with Section F1. Depreciation and use allowances are computed applying the following rules:

a. The computation of depreciation or use allowances shall be based on the acquisition cost of the assets involved. For this purpose, the acquisition cost will exclude (1) the cost of land; (2) any portion of the cost of buildings and equipment borne by or donated by the Government, irrespective of where title was originally vested or where it is presently located; and (3) any portion of the cost of buildings and equipment contributed by or for the institution where law or agreement prohibit recovery. For an asset donated to the institution by a third party, its fair market value at the time of the donation shall be considered as the acquisition cost.

b. In the use of the depreciation method, the following shall be observed:

(1) The period of useful service or useful life established in each case for usable capital assets must take into consideration such factors as type of construction, nature of the equipment, technological developments in the particular area, and the renewal and replacement policies followed for the individual items or classes of assets involved.

(2) The depreciation method used to charge the cost of an asset (or group of assets) to accounting periods shall reflect the pattern of consumption of the asset during its useful life. In the absence of clear evidence indicating that the expected consumption of the asset will be significantly greater in the early portions than in the later portions of its useful life, the straight-line method shall be presumed to be the appropriate method. Depreciation methods once used shall not be changed unless approved in advance by the cognizant Federal agency.

(3) Where the depreciation method is introduced for application to assets for which use allowance was previously charged, the aggregate amount of use allowances and depreciation applicable to such assets must not exceed the total acquisition cost of the assets.

(4) When the depreciation method is used for buildings, a building "shell" may be treated separately from other building components, such as plumbing system and heating and air conditioning system. Each component item may then be depreciated over its estimated useful life. On the other hand, the entire building, including the shell and all components, may be treated as a single asset and depreciated over a single useful life.

(5) Where the depreciation method is used for a particular class of assets, no depreciation may be allowed on any such assets that have outlived their depreciable lives. (But see also c(3), below.)

c. Under the use allowance method, the following shall be observed:

(1) The use allowance for buildigs and improvements (including improvements such as paved parking areas, fences, and sidewalks) will be computed at an annual rate not exceeding two percent of acquisition cost. The use allowance for equipment will be computed at an annual rate not exceeding six and two-thirds percent of acquisition cost.

(2) In contrast to the depreciation method, the entire building must be treated as a single asset without separating its "shell" from other building components under the use allowance method. The entire building must be treated as a single asset, and the two-percent use allowance limitation must be applied to all parts of the building. The two-percent limitation, however, need not be applied to equipment or other assets that are merely attached or fastened to the building but not permanently fixed and are used as furnishings, decorations or for specialized purposes (e.g., dentist chairs and dental treatment units, counters, laboratory benches bolted to the floor, dishwashers, and carpeting). Such equipment and assets will be considered as not being permanently fixed to the building if they can be removed without the need for costly or extensive alterations or repairs to the building to make the space usable for other purposes. Equipment and assets which meet these criteria will be subject to the six and two-thirds percent equipment use allowance.

(3) A reasonable use allowance may be negotiated for any assets that are considered to be fully depreciated, after taking into consideration the amount of depreciation previously charged to the Government, the estimated useful life remaining at the time of negotiation, the effect of any increased maintenance charges, decreased efficiency due to age, and any othe factors pertinent to the utilization of the asset for the purpose contemplated.

d. Except as otherwise provided in b and c above, a combination of the depreciation and use allowance methods may not be used, in like circumstances, for a single class of assets (e.g., buildings, office equipmet, and computer equipment).

e. Charges for use allowances or depreciation must be supported by adequate property records, and physical inventories must be taken at least once every two years to ensure that the assets exist and are usable, used, and needed. Statistical sampling techniques may be used in taking these inventories. In addition, when the depreciation method is used, adequate depreciation records showing the amount of depreciation taken each period must also be maintained.

10. *Donated services and property.* The value of donated services and property are not allowable either as a direct or indirect cost, except that depreciation or use allowances on donated assets are permitted in accordance with Section J9a. The value of donated services and property may be used to meet cost sharing or matching requirements, in accordance with OMB Circular No. A-110.

11. *Employee morale, health, and welfare costs and credits.* The costs of house publications, health or first-aid clinics and/or infirmaries, recreational activities, employees, counseling services, and other expenses incurred in accordance with the institution's established practice or custom for the improvement of working conditions, employer-employee relations, employee morale, and employee performance, are allowable. Income generated from any of these activities will be credited to the cost thereof unless such income has been irrevocably set over to employee welfare organizations.

12. *Entertainment costs.* Costs incurred for amusment, social activities, entertainment, and any items relating thereto, such as meals, lodging, rentals, transportation, and gratuities, are unallowable.

13. *Equipment and other capital expenditures.*

a. For purposes of this paragraph, the following definitions apply:

(1) *Equipment* means an article of nonexpendable tangible personal property having a useful life or more than two years, and an acquisition cost of $500 or more per unit. However, consistent with institutional policy, lower limits may be established.

(2) *Capital expenditure* means the cost of the asset including the cost to put it in place. Capital expenditure for equipment, for example, means the net invoice price of the equipment, including the cost of any modifications, attachments, accessories, or auxiliary apparatus necessary to make it usable for the purpose for which it is acquired. Ancillary charges, such as taxes, duty, protective intransit insurance, freight, and installation may be included in, or excluded from, capital expenditure cost in accordance with the institution's regular accounting practices.

(3) *Special purpose equipment* means equipment which is used only for research, medical, scientific, or other technical activities.

(4) *General purpose equipment* means equipment, the use of which is not limited only to research, medical, scientific or other technical activities. Examples of general purpose equipment include office equipment and furnishings, air conditioning equipment, reproduction and printing equipment, motor vehicles, and automatic data processing equipment.

b. The following rules of allowability shall apply to equipment and other capital expenditures:

(1) Capital expenditures for general purpose equipment, buildings, and the land are unallowable as direct charges, except where approved in advance by the sponsoring agency.

(2) Capital expenditures for special purpose equipment are allowable as direct charges, provided that the acquisition of items having a unit cost of $1,000 or more is approved in advance by the sponsoring agency.

(3) Capital expenditures for improvements to land, buildings, or equipment which materially increase their value or useful life are unallowable as direct charges, except where approved in advance by the sponsoring agency.

(4) Capital expenditures are unallowable as indirect costs. But see Section J9 for allowability of depreciation or use allowance on buildings, capital improvements, and equipment. Also see Section J33 for allowability of rental costs on land, buildings, and equipment.

14. *Fines and penalties.* Costs resulting from violations of, or failure of the institution to comply with, Federal, State, and local laws and regulations are unallowable, except when incurred as a result of compliance with specific provisions of the sponsored agreement, or instructions in writing from the contracting officer or equivalent.

15. *Fringe benefits.*

a. Fringe benefits in the form of regular compensation paid to employees during periods of authorized absences from the job, such as for annual leave, sick leave, military leave, and the like, are allowable, provided such costs are distributed to all institutional activities in proportion to the relative amount of time or effort actually devoted by the employees. See Section J35 for treatment of sabbatical leave.

b. Fringe benefits in the form of employer contributions or expenses for social security, employee insurance, workmen's compensation insurance, tuition or remission of tuition for individual employees or their families and the like are allowable, provided such benefits are granted in accordance with established institutional policies, and are distributed to all institutional activities on an equitable basis. See Section J36b for treatment of tuition remission provided to students.

c. Rules for pension plan costs are as follows:

(1) Costs of the institution's pension plan which are incurred in accordance with the established policies of the institution are allowable, provided (a) such policies meet the test of reasonableness; (b) the methods of cost allocation are equitable for all activities; (c) the amount of pension cost assigned to each fiscal year is determined in accordance with (2) below; and (d) the cost assigned to a given fiscal year is paid or funded for all plan participants within six months after the end of that year.

(2) The amount of pension cost assigned to each fiscal year shall be determined in accordance with generally accepted accounting principles. Institutions may elect to follow the "Cost Accounting Standard for Composition and Measurement of Pension Cost" (4 CFR Part 412).

(3) Premiums paid for pension plan termination insurance pursuant to the Employee Retirement Income Security Act of 1974 (Public Law 93-406) are allowable. Late payment charges on such premiums are unallowable. Excise taxes on accumulated funding deficiencies and prohibited transactions of pension plan fiduciaries imposed under the Employee Retirement Income Security Act are also unallowable.

d. Fringe benefit may be assigned to cost objectives by identifying specific benefits to specific individual employees or by allocating on the basis of the salaries and wages of the employees receiving the benefits. When the allocation method is used, separate allocations must be made to selective groupings of employees, if the costs in relationship to salaries and wages differ significantly for different groups of employees. Also fringe benefits related to institutional salaries and wages treated as direct costs may be treated as direct costs.

16. *Insurance and indemnification.*

a. Costs of insurance required or approve, and maintained, pursuant to the sponsored agreement, are allowable.

b. Costs of other insurance maintained by the institution in connection with the general conduct of its activities, are allowable subject to the following limitations: (1) types and extent and cost of coverage must be in accordance with sound institutional practice; (2) costs of insurance or of any contributions to any reserve covering the risk of loss of or damage to Government-owned property are unallowable, except to the extent that the Government has specifically required or approved such costs; and (3) costs of insurance on the lives of officers or trustees are unallowable except where such insurance is part of an employee plan which is not unduly restricted.

c. Contributions to a reserve for a self-insurance program are allowable, to the extent that the types of coverage, extent of coverage, and the rates and premiums would have been allowed had insurance been purchased to cover the risks.

d. Actual losses which could have been covered by permissible insurance (whether through purchased incurance or self-insurance) are unallowable, unless expressly provided for in the sponsored agreement, except that costs incurred because of losses not covered under existing deductible clauses for insurance coverage provided in keeping with sound management practice as well as minor losses not covered by insurance, such as spoilage, breakage and disappearance of small hand tools, which occur in the ordinary course of operations, are allowable.

e. Indemnification includes securing the institution against liabilities to third persons and other losses not compensated by insurance or otherwise. The Government is obligated to indemnify the institution only to the extent expressly provided for in the sponsored agreement, except as provided in d above.

17. *Interest, fund raising, and investment management costs.*

a. Costs incurred for interest on borrowed capital or temporary use of endowment funds, however represented, are unallowable.

b. Costs of organized fund raising, including financial campaigns, endowment drives, solicitation of gifts and bequests, and similar expenses incurred solely to raise capital or obtain contributions, are unallowable.

c. Costs of investment counsel and staff and similar expenses incurred solely to enhance income from investments are unallowable.

d. Costs related to the physical custody and control of monies and securities are allowable.

18. *Labor relations costs.* Costs incurred in maintaining satisfactory relations between the institution and its employees, including costs of labor management committees, employees' publications, and other related activities, are allowable.

19. *Losses on other sponsered agreements or contracts.* Any excess of costs over income under any other sponsored agreement or contract of any nature is unallowable. This includes, but is not limited to, the institution's contributed portion by reason of cost-sharing agreements or any under-recoveries through negotiation of flat amounts for indirect costs.

20. *Maintenance and repair costs.* Costs incurred for necessary maintenance, repair or upkeep of property (including Government property unless otherwise provided for) which neither add to the permanent value of the property nor appreciably prolong its intended life but keep it in an efficient operating condition, are allowable.

21. *Material costs.* Costs incurred for purchased materials, supplies, and fabricated parts directly or indirectly related to the sponsored agreement, are allowable. Purchases made specifically for the sponsored agreement should be charged thereto at their actual prices after deducting all cash discounts, trade discounts, rebates, and allowances received by the institution. Withdrawals from general stores or stockrooms should be charged at their cost under any recognized method of pricing stores withdrawals conforming to sound accounting practices consistently followed by the institution. Incoming transportation charges are a proper part of material cost. Direct material cost should include only the materials and supplies actually used for the performance of the sponsored agreement, and due credit should be given for any excess materials retained, or returned to vendors. Due credit should be given for all proceeds or value received for any scrap resulting from work under the sponsored agreement. Where Government-donated or furnished material is used in performing the sponsored agreement, such material will be used without charge.

22. *Memberships, subscriptions and professional activity costs.*

a. Costs of the institution's membership in civic, business, technical, and professional organizations are allowable.

b. Costs of the institution's subscriptions to civic, business, professional, and technical periodicals are allowable.

c. Costs of meetings and conferences, when the primary purpose is the dissemination of technical information, are allowable. This includes costs of meals, transportation, rental of facilities, and other items incidental to such meetings or conferences.

23. *Patent costs.* Costs of preparing disclosures, reports, and other documents required by the sponsored agreement, and of

searching the art to the extent necessary to make such invention disclosures, are allowable. In accordance with the clauses of the sponsored agreement relating to patents, costs of preparing documents and any other patent costs, in connection with the filing of a patent application where title is conveyed to the Government, are allowable. (See also Section J34.)

24. *Plant security costs.* Necessary expenses incurred to comply with security requirements, including wages, uniforms and equipment of personnel engaged in plant protection, are allowable.

25. *Preagreement costs.* Costs incurred prior to the effective date of the sponsored agreement, whether or not they would have been allowable thereunder if incurred after such date, are unallowable unless approved by the sponsoring agency.

26. *Professional services costs.*

a. Costs of professional services rendered by the members of a particular profession who are not employees of the institution are allowable, subject to b and c below, when reasonable in relation to the services rendered and when not contingent upon recovery of the costs from the Government. Retainer fees to be allowable must be reasonably supported by evidence of services rendered.

b. Factors to be considered in determining the allowability of costs in a particular case include (1) the past pattern of such costs, particularly in the years prior to the award of sponsored agreements; (2) the impact of sponsored agreements on the institution's total activity; (3) the nature and scope of managerial services expected of the institution's own organizations; and (4) whether the proportion of Government work to the institution's total activity is such as to influence the institution in favor of incurring the cost, particularly where the services rendered are not of a continuing nature and have little relationship to work under sponsored agreements.

c. Costs of legal, accounting, and consulting services, and related costs, incurred in connection with the prosecution of claims against the Government, are unallowable. Costs of legal, accounting and consulting services, and related costs, incurred in connection with patent infringement litigation, are unallowable unless otherwise provided for in the sponsored agreements.

27. *Profits and losses on disposition of plant equipment or other capital assets.* Profits or losses arising from the sale or exchange of plant, facilities, equipment or other capital assets, including sale or exchange of either short-term or long-term investments, shall not be considered in computing the costs of sponsored agreements except for pension plans as provided in Section J15c. When assets acquired with Federal funds, in part or wholly, are disposed of, the distribution of the proceeds shall be made in accordance with Attachment N, OMB Circular No. A-110.

28. *Proposal costs.* Proposal costs are the costs of preparing bids or proposals on potential Government and nongovernment sponsored agreements or projects, including the development of data necessary to support the institution's bids or proposals. Proposal costs of the current accounting period of both successful and unsuccessful bids and proposals normally should be treated as indirect costs and allocated currently to all activities of the institution, and no proposal costs of past accounting periods will be allocable to the current period. However, the institution's established practice may be to treat proposal costs by some other recognized method. Regardless of the method used, the results obtained may be accepted only if found to be reasonable and equitable.

29. *Public information services costs.* Cost of news releases pertaining to specific research or scientific accomplishment are allowable, when they result from performance of sponsored agreements.

30. *Rearrangement and alteration costs.* Cost incurred for ordinary or normal rearrangement and alteration of facilities are allowable. Special arrangement and alteration costs incurred specifically for the project are allowable when such work has been approved in advance by the sponsoring agency.

31. *Reconversion costs.* Costs incurred in the restoration or rehabilitation of the institution's facilities to approximately the same condition existing immediately prior to commencement of a sponsored agreement, fair wear and tear excepted, are allowable.

32. *Recruiting costs.*

a. Subject to b, c, and d below, and provided that the size of the staff recruited and maintained is in keeping with workload requirements, costs of "help wanted" advertising, operating costs of an employment office necessary to secure and maintain an adequate staff, costs of operating an aptitude and educational testing program, travel costs of employees while engaged in recruiting personnel, travel costs of applicants for interviews for prospective employment, and relocation costs incurred incident to recruitment of new employees, are allowable to the extent that such costs are incurred pursuant to a well managed recruitment program. Where the institution uses employment agencies, costs not in excess of standard commercial rates for such services are allowable.

b. In publications, costs of help wanted advertising that includes color, includes advertising material for other than recruitment purposes, or is excessive in size (taking into consideration recruitment purposes for which intended and normal institutional practices in this respect), are unallowable.

c. Costs of help wanted advertising, special emoluments, fringe benefits, and salary allowances incurred to attract professional personnel from other institutions that do not meet the test of reasonableness or do not conform with the established practices of the institution, are unallowable.

d. Where relocation costs incurred incident to recruitment of a new employee have been allowed either as an allocable direct or indirect cost, and the newly hired employee resigns for reasons within his control within twelve months after hire, the institution will be required to refund or credit such relocation costs to the Government.

33. *Rental cost of buildings and equipment.*

a. Rental costs of buildings or equipment are allowable to the extent that the decision to rent or lease is in accord with Section C-3. Rental arrangements should be reviewed periodically to determine if circumstances have changed and other options are available.

b. Rental costs under "sale and lease back" arrangements are allowable only up to the amount that would be allowed if the institution continued to own the property.

c. Rental costs under "less-than-arms-length" leases are allowable only up to the amount that would be allowed if the institution owned the property. For this purpose, a "less-than-arms-length" lease is one under which one party to the lease agreement is able to control or substantially influence the actions of the other.

d. Where significant rental costs are incurred under leases which create a material equity in the leased property, they are allowable only up to the amount that would be allowed if the institution purchased the property on the date the lease agreement was executed. For this purpose, a material equity in the property exists when the lease:

(1) is noncancelable or is cancelable only upon the occurrence of some remote contingency, and

(2) has one or more of the following characteristics:

(a) Title to the property passes to the institution at some time during or after the lease period.

(b) The term of the lease corresponds substantially to the estimated useful life of the property (i.e., the period of economic usefulness to the legal owner of the property).

(c) The initial term is less than the useful life of the property and the institution has the option to renew the lease for the remaining useful life at substantially less than fair rental value.

(d) The property was acquired by the leasor to meet the special needs of the institution and will probably be usuable only for that purpose and only by the institution.

(e) The institution has the right, during or at the expiration of the lease, to purchase the property at a price which at the inception of the lease appears to be substantially less that the probable fair market value at the time it is permitted to purchase the property (commonly called a lease with a bargain purchase option), except for any discount normally given to educational institutions.

34. *Royalties and other costs for use of patents.* Royalties on a patent or amortization of the cost of acquiring a patent or invention or rights thereto, necessary for the proper performance of the sponsored agreement and applicable to tasks or processes thereunder, are allowable unless the Government has a license or the right to free use of the patent, the patent has been adjudicated to be invalid or has been administratively determined to be invalid, the patent is considered to be unenforceable, or the patent has expired.

35. *Sabbatical leave costs.* Costs of leave of absence by employees for performance of graduate work or sabbatical study, travel, or research are allowable provided the institution has a uniform policy on sabbatical leave for persons engagd in instruction and persons engaged in research. Such costs will be allocated on an equitable basis among all related activities of the institution. Where sabbatical leave is included in fringe benefits for which a cost is determined for assessment as a direct charge, the aggregate amount of such assessments applicable to all work of the institution during the base period must be reasonable in relation to the institution's actual experience under its sabbatical leave policy.

36. *Scholarships and student aid costs.*

a. Costs of scholarships, fellowships, and other programs of student aid are allowable only when the purpose of the sponsored agreement is to provide training to selected participants and the charge is approved by the sponsoring agency. However, tuition remission and other forms of compensation paid as, or in lieu of, wages to students performing necessary work are allowable provided that (1) there is a bonafide employer-employee relationship between the student and the institution for the work performed, (2) the tuition or other payments are reasonable compensation for the work performed and are conditioned explicitly upon the performance of necessary work, and (3) it is the institution's practice to similarly compensate students in nonsponsored as well as sponsored activities.

b. Charges for tuition remission and other forms of compensation paid to students as, or in lieu of, salaries and wages shall be subject to the reporting requirements stipulated in Section J6, and shall be treated as direct or indirect cost in accordance with the actual work being performed. Tuition remission may be charged on an average rate basis.

37. *Severance pay.*

a. Severance pay is compensation in addition to regular salary and wages which is paid by an institution to employees whose services are being terminated. Costs of severance pay are allowable only to the extent that such payments are required by law, by employer-employee agreement, by established policy that constitutes in effect an implied agreement on the institution's part, or by circumstances of the particular employment.

b. Severance payments that are due to normal recurring turnover and which otherwise meet the conditions of a above may be allowed provided the actual costs of such severance payments are regarded as expenses applicable to the current fiscal year and are equitably distributed among the institution's activities during that period.

c. Severance payments that are due to abnormal or mass terminations are of such conjectural nature that allowability must be determined on a case-by-case basis. However, the Government recognizes its obligation to participate, to the extent of its fair share, in any specific payment.

38. *Specialized service facilities.*

a. The costs of institutional services involving the use of highly complex or specialized facilities such as electronic computers, wind tunnels, and reactors are allowable, provided the charge for the service meets the conditions of b through d below.

b. The cost of each service normally shall consist of both its direct costs and its allocable share of indirect costs with deductions for appropriate income or Federal financing as describing in Section C5.

c. The cost of such institutional services when material in amount will be charged directly to users, including sponsored agreements based on actual use of the services and a schedule of rates that does not discriminate between federally and nonfederally supported activities of the institution, including used by the institution for internal purposes. Charges for the use of specialized facilities should be designed to recover not more than the aggregate cost of the services over a long-term period agreed to by the institution and the cognizant Federal agency. Accordingly, it is not necessary that the rates charged for services be equal to the cost of providing those services during any one fiscal year as long as rates are reviewed periodically for consistency with the long-term plan and adjusted if necessary.

d. Where the costs incurred for such institutional services are not material, they may be allocated as indirect costs. Such arrangements must be agreed to by the institution and the cognizant Federal agency.

e. Where it is in the best interest of the Government and the institution to establish alternative costing arrangements, such arrangements may be worked out with the cognizant Federal agency.

39. *Special services costs.* Costs incurred for general public relations activities, alumni activities, and similar services, are unallowable.

40. *Student activity costs.* Costs incurred for intramural activities, student publications, student clubs, and other student activities, are unallowable, unless specifically provided for in the sponsored agreements.

41. *Taxes.*

a. In general, taxes which the institution is required to pay and which are paid or accrued in accordance with generally accepted accounting principles are allowable. Payments made to local governments in lieu of taxes which are commensurate with the local government services received are allowable, except for (1) taxes from which exemptions are available to the institution directly or which are available to the institution based on an exemption afforded the Government, and in the latter case when the sponsoring agency makes available the necessary exemption certificates; and (2) special assesssments on land which represent capital improvements.

b. Any refund of taxes, interest, or penalties, and any payment to the institution of interest thereon, attributable to taxes, interest, or penalties which were allowed as sponsored agreement costs, will be credited or paid to the Government in the manner directed by the Government. However, any interest actually paid or credited to an institution incident to a refund of tax, interest, and penalty will be paid or credited to the Government only to the extent that such interest accrued over the period during which the institution had been reimbursed by the Government for the taxes, interest, and penalties.

42. *Transportation costs.* Costs incurred for freight, express, cartage, postage, and other transportation services relating either to goods purchased, in process, or delivered, are allowable. When such costs can readily be identified with the items involved, they may be charged directly as transportation costs or added to the cost of such items. Where identification with the materials received cannot readily be made, inbound transportation costs may be charged to the appropriate indirect cost accounts if the institution follows a consistent, equitable procedure in this respect. Outbound freight, if reimbursable under the terms of the sponsored agreement, should be treated as a direct cost.

43. *Travel costs.*

a. Travel costs are the expenses for transportation, lodging, subsistence, and related items incurred by employees who are in travel status on official business of the institution. Such costs may be charged on an actual basis, on a per diem or mileage basis in lieu of actual costs incurred, or on a combination of the two, provided the method used is applied to an entire trip and not to selected days of the trip, and results in charges consistent with those normally allowed by the institution in its regular operations.

b. Travel costs are allowable subject to c, d, e, and f below, when they are directly attributable to specific work under a sponsored agreement or are incurred in the normal course of administration of the institution or a department or program thereof.

c. The difference in cost between first-class air accommodations and less than first-class air accommodations is unallowable except when less than first-class air accommodations are not reasonably available to meet necessary mission requirements, such as where less than first-class accommodations would (1) require circuitous routing, (2) require travel during unreasonable hours, (3) greatly increase the duration of the flight, (4) result in additional costs which would offset the transportation savings, or (5) offer accommodations which are not reasonably adequate for the medical needs of the traveler.

d. Costs of personnel movements of a special or mass nature are allowable only when authorized or approved in writing by the sponsoring agency or its authorized representative.

e. Foreign travel costs are allowable only when the travel has received specific prior approval. Each separate foreign trip must be specifically approved. For purposes of this provision, foreign travel is defined as any travel outside of Canada and the United States and its territories and possessions. However, for an organization located outside Canada and the United States and its territories and possessions, foreign travel means travel outside that country.

f. Domestic travel costs are allowable when permitted by the sponsored agreement. Expenditures for such travel will not be allowed if they exceed the amount specified by more than 25% or $500, whichever is greater, except with an advanced approval of the sponsoring agency.

44. *Termination costs applicable to sponsored agreements.*

a. Termination of sponsored agreements generally gives rise to the incurrence of costs or to the need for special treatment of costs, which would not have arisen had the agreement not been terminated. Items peculiar to termination are set forth below. They are to be used in conjunction with all other provisions of this Circular in the case of termination.

b. The cost of common items of material reasonably usable on the institution's other work will not be allowable unless the institution submits evidence that it could not retain such items at cost without sustaining a loss. In deciding whether such items are reasonably usable on other work of the institution, consideration should be given to the institution's plans and orders for current and scheduled work. Contemporaneous purchases of common items by the institution will be regarded as evidence that such items are reasonably usable on the institution's other work. Any acceptance of common items as allowable to the terminated portion of the agreement should be limited to the extent that the quantities of such items on hand, in transit, and on order are in excess of the reasonable quantitative requirements of other work.

c. If in a particular case, despite all reasonable efforts by the institution, certain costs cannot be discontinued immediately after the effective date of termination, such costs are generally allowable within the limitations set forth in this Circular, except that any such costs continuing after termination due to the negligent or willful failure of the institution to discontinue such costs will be considered unacceptable.

d. Loss of useful value of special tooling, and special machinery and equipment is generally allowable, provided (1) such special tooling, machinery, or equipment is not reasonably capable of use in the other work of the institution; (2) the interest of the Government is protected by transfer of title or by other means deemed appropriate by the contracting officer or equivalent; and (3) the loss of useful value as to any one terminated agreement is limited to that portion of the acquisition cost which bears the same ratio to the total acquisition cost as the terminated portion of the agreement bears to the entire terminated agreement and other Government agreements for which the special tooling, special machinery, or equipment was acquired.

e. Rental costs under unexpired leases are generally allowable where clearly shown to have been reasonably necessary for the performance of the terminated agreement, less the residual value of such leases, if (1) the amount of such rental claimed does not exceed the reasonable use value of the property leased for the period of the agreement and such further period as may be reasonable; and (2) the institution makes all reasonable efforts to terminate, assign, settle, or otherwise reduce the cost of such lease. There also may be included the cost of alterations of such leased property, provided such alterations were necessary for the performance of the agreement, and of reasonable restoration required by the provisions of the lease.

f. Settlement expenses including the following are generally allowable: (1) accounting, legal, clerical, and similar costs reasonably necessary for the preparation and presentation to contracting officers or equivalent of settlement claims and supporting data with respect to the terminated portion of the agreement, and the termination and settlement of subagreements; and (2) reasonable costs for the storage, transportation, protection, and disposition of property provided by the Government or acquired or produced by the institution for the agreement, except when the institution is reimbursed for disposals at a predetermined amount in accordance with the provisions of Circular No. A-110.

g. Claims under subagreements, including the allocable portion of claims which are common to the agreement and to other work of the institution, are generally allowable.

K. CERTIFICATION OF CHARGES

To assure that expenditures for sponsored agreements are proper and in accordance with the agreement documents and approved project budgets, the annual and/or final fiscal reports or vouchers requesting payment under the agreements will include a certification, signed by an authorized official of the university, which reads essentially as follows: "I certify that all expenditures reported (or payment requested) are for appropriate purposes and in accordance with the provisions of the application and award documents."

[FR Doc. 79-6443 Filed 3-5-79; 8:45 am]

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF MATHEMATICS
5734 UNIVERSITY AVENUE
CHICAGO · ILLINOIS 60637

Attachment I

March 31, 1980.

MEMORANDUM

To : All who are interested in the effective conduct of scientific research in universities

From : Saunders Mac Lane, SM Department of Mathematics, University of Chicago

Subject : Recent OMB Regulations on Work Records for Science: Circular A-21.

New accountability rules for direct and indirect cost calculations by universities are set out in the new (1979) OMB circular A-21, entitled "Principles for determining costs applicable to grants, contracts and other agreements with Education Institutions.

In this circular, the section on Compensation for Personal Services calls for a 100% accounting of the work or activity of faculty members and other professionals. This accounting is to be renedered on one of two plans: Monitored Workload, or Personnel Activity Reports.

Clearly, appropriate accountability for the use of government funds to support science is requisite. However, this particular form of accountability, as analysed in detail in my previous memorandum (January 30th) under the same title, raises several very serious questions:

1) The call for 100% accounting of "the work for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution" appears to suggest possible government control over that portion of this work not supported by government funds. Even the implication that there might later be such control seems inappropriate.

2) Percentage accounting for work (or activity, or effort, or time) is meaningless. This follows from the nature of scientific effort and the unpredictable interaction between research, teaching and other university activities; there is a detailed discussion in my previous memo. Using records of meaningless percentages is likely to lead to future troubles when there arise questions as to how and whether these percentages correspond to reality.

3) Percentages of salary have objective meaning, but not percentages of work. Accounting, to be effective, should be carried out in terms of real quantities, not fictions.

4) Accounting for "work", as formulated in A-21, is not closely tied to the specific projects supported by government funds.

5) The extensive negotiations leading to the new OMB Circular Number A-21 do not appear to have involved adequate consultation of the opinions and work habits of university faculty.

6) Percentage accounting is unlikely to catch the occasional real abuses in the use of government funds.

7) Detailed accounting will undermine the atmosphere necessary for scientific work and may discourage entry into science by able young people.

The OMB and other government agencies, in proposing this form of accountability, appear to have had two primary objectives:

- As of direct cost, to provide evidence to the government that the research has involved activity appropriate for the money received.

- As of indirect costs, to establish a basis for certain of the indirect cost pools (those called "departmental administration" and "sponsored project administration") and also to provide a basis for the total effort spent on direct performance of research, as this is used in the calculation of indirect cost.

Because appropriate accountability for public funds is requisite and proper, what is now needed is the explicit formulation of alternatives to the unsatisfactory total accounting for work or activity proposed under A-21. The recent report from the National Commission on Research makes useful proposals. (Accountability: Restoring the Quality of the Partnership. Science 207, pp. 1177-1182, March 14, 1980)

Recommendation 5, concerned with direct cost, reads:

"5) Institute self-regulatory methods. A simpler and less costly method of effort reporting based on responsible self-regulation should be instituted. Thus the government should accept certifications by individual investigators that direct salary charges to their research agreements are reasonable and fair, provided that each certification is accompanied by the federal program officer's review of the reasonableness of these expenditures for the work undertaken."

Recommendation 6: concerned with indirect costs reads:

"6) Allowing for a percentage of indirect costs. Government agencies should jointly construct an option, analogous to the "standard deduction" in income tax calculation, to charge activity which is treated as indirect costs under sponsored agreements. The fixed percentage would be negotiated."

A final solution of these questions may involve more detailed consideration, but these two recommendations indicate that there are indeed viable alternatives to the present unsatisfactory proposals.

Saunders Mac Lane
Saunders Mac Lane
March 31, 1980

MEMO

To: All who are interested in the effective conduct of scientific research in universities

From: Saunders Mac Lane Saunders Mac Lane

Subject: OMB Regulations on Time Records for Faculty Members

1. Introduction

New government regulations now propose 100% accounting of the time of faculty members doing sponsored research. This change raises a number of fundamental issues about the effective conduct of research in academic institutions. These issues are of interest to scientists, to university administrators, and to government officials involved in helping to support research.

Early in 1979 the Office of Management and Budget (OMB) issued a revised version of its circular A-21, dealing with cost principles for educational institutions. Item 6 in this circular, beginning on page 23 (See Appendix A) deals with "Compensation for personal services" and proposes new rules which raise, in new form, the complex and delicate problem of "Time and Effort Reporting".

This memo will summarize the new rules and describe the resulting situation. It is my considered judgement that this situation involves serious problems, with questionable constraints on academic research and the use of meaningless percentages. Hence the situation needs reconsideration at the highest level.

2. Recent History

An earlier version of circular A-21, issued in 1965, required certain time and effort reporting. After extensive protests from the academic community emphasizing the constraining effects of such reporting, this circular was modified in 1968 so as to be less prescriptive (See Appendix B). At that time, it was held that reporting on effort was more realistic than reporting on time.

3. Present Requirements

The new circular A-21, under the heading "Payroll distribution" states "For each organizational unit of an institution, the distribution of salaries and wages . . . will be based on either a system of monitored workload or a system of personnel activity reports."

These two alternative systems are then described. Page 23 states "the monitored workload system used for salaries and wages charged directly or indirectly to sponsored agreements will meet the following standards:

"(1) A system of budgeted or assigned workload will be incorporated into the official records of the institution and encompass both sponsored and all other activities on an integrated basis . . .

"(2) The system will reasonably reflect workload of employees, accounting for 100% of the work for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution."

The second system, that of personnel activity reporting is described, on page 24, as follows:

"(2) The reports will reflect an after-the-fact reporting of the percentage of activity of each employee. Charges may be made initially on the basis of estimates made before the services are performed, provided that such charges are promptly adjusted if significant differences are indicated by activity reports.

"(3) Each report will account for 100% of the activity for which the employee is compensated and which is required in fulfillment of the employee's obligations to the instituiton. The report will reasonably reflect the percentage of activity applicable to each sponsored agreement, each indirect cost category, and each major function of the institution."

4. Central Difficulty

Both of these systems appear to require, for some or all professional academic employees—professors and others—that there be an accounting for 100% of the person's time ("work" or "activity"), as compensated by the university. It is this provision which requires particular attention.

The interpretation of this provision is complicated; there might well be different interpretations at different universities. An official at one university has suggested that most universities will use the Personnel Activity Reports rather than the Monitored Workload system, that not all faculty members will be required to fill out these reports, and that these reports are likely to reflect a half-dozen types of activities, the cumulative total of which must be 100%.

5. Various Interests Involved

Different groups are involved in these regulations. Congress wishes more exact accountability of public funds expended in the support of science. The OMB must specify how this accountability is to be realized. Administrative officers at universities are responsible for ensuring that their university is reimbursed for direct and indirect costs of sponsored research. Current inflationary pressures make this responsibility heavier.

Government officials (NSF, NIH, ONR, etc.) must see to the monitoring of the grants for contracts that they issue.

University faculty desire federal support for scientific and technological research, much of which would be impossible without that federal support. They also desire flexible conditions for carrying out research, and freedom from distracting bureaucratic detail.

Ultimately the country and mankind need the best final product of research, so need conditions which best encourage that research.

6. Long-range Considerations

One may wish to consider the possible reasons behind the specification of 100% of time in the current circular A-21. These reasons may involve a number of facets of the question of governance of the universities. Long ago (ONR, in the late 1940's) a decision was made that the government support of science in universities would be focussed on individual projects of scientists. With the development of the system, and with the subsequent constraints upon funding, there came to be scientists—especially those with interdisciplinary interests—who needed support from more than one agency; either because any one agency might not have had sufficient funds in the appropriate program, or because the agency program did not have the same range of interests as those of the principal investigator. Such multiple support of sciences has strong merits, in particular the merit of not making the support of novel scientific ideas dependent on the judgement of any one agency. In recent years, with further constraints in real government support of sciences, the tendency for multiple grants to individual investigators has increased. As Philip Handler said in a recent speech (January 29, 1980) "The real resources available to an average American scientist have diminished by a factor of 2 in the last decade."

At the same time, the financial squeeze on universities due to inflation, heating costs and the like, have made it necessary for fiscal officers of universities to search for more government support in all appropriate ways, especially by overhead, and by support of portions of faculty salaries. This has tended to increase the number of principal investigators who have multiple salary support, such as would be verified under 100% of time allocations.

Thus a combination of forces acting over years has led to the situation which the new policies in A-21 are intended to regulate.

7. Types of Difficulties

The present version of circular A-21 is the result of extensive negotiations between officials of OMB and some university officials. It is not clear that the interests of all parties were represented in this negotiation. In particular, some academic scientists believe that these systems, developed without consulting them, deprive them of their traditional independence and thus hamper innovative research.

This section will summarize the difficulties which this regulation now raises for academic employees, especially professors and research associates. These difficulties are present whichever of the two specified

OMB systems is adopted by each university. The difficulty exists because the last sentence of (1) for the monitored workload system seems to apply to all activities of the university including those without government support and because both systems speak of "100% of the work for which the employee is compensated." There are at least four difficulties in this specification: First, it involves a complex calculation of what is full work. Second, it appears to require someone, the employee or some administrator, to make an exact account of the employee's time. Third, it assumes that there is somewhere a standard as to what work is required "in fulfillment of the employee's obligations." Finally, part of that "100% of the work" is strictly university work and not the government's concern.

The motivation for specifying such a percentage of work is clear, since there are cases of faculty members on a variety of grants with the salaries charged in complex fashions to their several grants. On the other hand, it is well-known to faculty members that it is nearly impossible to clearly distinguish how much time is devoted to research and how much to teaching or administration. If a professor is teaching an advanced course on non-compact Riemann surfaces and has a grant both from the NSF and the ONR to do research on this topic and also has students, not involved in the grant, doing such research, how does he know when his thought on the presentation of the materials in the course is educational or is stimulating to his research? He does know of many instances in the past when the teaching has helped the research, or the converse. As he spends time to help that graduate student in writing a thesis and in the process thinks of something that will help in this research, is he to charge it to research or teaching? This example (of course, its point is not limited to Riemann surfaces or to mathematics) clearly indicates why for professors there is no such thing as an accounting of exact percentages.

Note that Circular A-21 at the top of page 23 has the caveat "reliance must be placed on reasonably accurate approximations." This is not very helpful, since it is hard to make sense of an "approximation" to a number or percentage which is not there and has no exact meaning.

Another ambiguity is this: Which professional work is wholly the responsibility of his academic institution? If professor Y, drawing his salary from the institution, gets elected president of the American Association for Experimental Biophysics and consequently spends quite a few hours writing letters to keep this organization afloat and to get its meetings organized, is that time part of the time required by his appointment to the institution? If professor Z does consulting work for which he is recompensed and thereby gets ideas which help his research and his students, how then does one account for these consulting hours?

These examples indicate that there are not now, and probably never can be, clear definitions for a professor of "the employee's obligations to the institution". It therefore makes no sense for a government organization to try to define percentages in terms of these obligations.

Still another ambiguity arises because different universities have different rules, sometimes unclear, as to the amount of reimbursed outside consulting which may be undertaken by a faculty member. The new circular A-21 specifies rules to apply in some such cases (page 26 foot, in Appendix A). The result might be the general imposition of formal rules about consulting. Such a result would be inflexible and divisive.

8. Costs and Abuses

This version of workload or activity reporting evidently is intended to avoid abuses and apparent abuses which have arisen. There have been cases of such abuses. There have also been other cases, not abuses, where an exact accounting trail of personnel effort has not been available. On the other hand, it is clear that the elaborate system proposed in A-21 is likely to cost more to implement than the total of abuses likely to be avoided. As for the accounting trail, that is also costly. If it simply results in better accounting for money that was anyway spent for science, it is not clear that it is worth the cost.

The costs are not just those of executing detailed percentage calculations of workload distribution. Costs also include the loss of morale caused by the unexpected extension of government regulation of the detailed work of scientists and other academics. Such costs, though hidden, can be substantial, as they may hamper originality, or discourage independent young people from entering the academic profession.

9. Summary and Statement of Opinion

Long ago the government chose to support research in science and technology at universities in order to further new discoveries which would help both our own country and the whole of mankind. This support goes to members of the academic community. This community generally has high standards of accountability for direct expenses of travel, equipment and the like. However, for this community, time spent on research in its manifold forms is not accurately accountable, so that any system of percentage accounts is sure to involve artificiality and therefore ultimately to lead to additional abuses which in turn would require additional specific regulations. Constraints on time are counter to the spirit and intent of those who struggle to discover new results: Therefore these constraints are inevitably counter-productive. They will diminish and divert the very scientific progress for which the monies are expended. Finally, the idea of 100% accounting intrudes on activities which are the concern only of the universities.

10. Proposal

Since the present regulations in circular A-21 were negotiated primarily with controllers and other officials responsible for accounting at universities and since the issue transcends these concerns, I recommend that there be renewed consideration of the whole problem, to prepare some new plan to meet the needs of accountability and to avoid abuses, without requiring time-cards or percentage-of-time accounting for academic staff.

For example, proposals for grants or contracts could specify in advance the intended effort of principal investigators and other academic staff and final reports on such grants and contracts could be required to specify what effort was actually made. This could be made specific to the grant or contract in such a way as to make the responsibility on academic staff even more explicit, thus less subject to abuses and much less invasive of academic customs.

The problem has also been studied extensively by the National Commission on Research, which has a report under preparation: "Accountability Restoring the quality of the partnership".

Saunders Mac Lane
Department of Mathematics
University of Chicago

Total Reporting for Scientific Work

Saunders Mac Lane

Summary. The project grant system, which has been so effective in the support of scientific research in the United States, has included support of the indirect costs of that research. The desire to clearly justify these costs and to trace abuses has led the Office of Management and Budget to issue new rules. One such rule requires reporting for 100 percent of the work of scientists. The character of this rule raises fundamental questions about the possible control of universities by the government. This article is intended to describe the background of these questions and to examine their consequences.

Rules for direct and indirect cost calculations by universities are set out in the new (1979) Office of Management and Budget (OMB) circular A-21, entitled "Cost Principles for Educational Institutions" (*1*). The section in this circular on "Compensation for personal services" calls for a complete reporting of the work or activity of faculty members and other professionals, to be rendered on one of two plans: (i) monitored workload or (ii) personnel activity reports. Each of these plans proposes a single system to meet the very different problems presented by direct costs and by indirect costs.

The monitored workload plan is based on budgeted or (pre-) assigned workloads, updated to reflect all significant changes in workload distribution. The description of this system [under item J6c(2)] specifies that "The system will reasonably reflect workload of employees, accounting for 100 percent of the work for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution."

The personnel activity reports, on the other hand [items J6d(2) and (3)], "will reflect an after-the-fact reporting of the percentage of activity of each employee. . . . Each report will account for 100 percent of the activity for which the employee is compensated and which is required in fulfillment of the employee's obligations to the institution."

In other respects these two plans differ. The monitored workload plan is based on preassigned workload, and the preassigned figures must be adjusted to record changes in workload; it applies to salaries and wages of professional and professorial staff, but not to nonprofessional employees. The personnel activity plan can apply to all employees whose salaries and wages are charged to direct or indirect costs under government grants.

In both cases it is specified that the system will reasonably reflect "the percentage of activity applicable to each sponsored agreement, each indirect cost category, and each major function of the institution." The indirect cost categories involved include "departmental administration," "sponsored project administration," and "student administration and services." The major functions of the institution are "instruction" (including "departmental research"), "organized research" (that is, research sponsored by federal agencies and nonfederal organizations), "other sponsored activities," and "other institutional activities." The percentage reporting required thus potentially involves a considerable number of different categories for each faculty member or professional employee.

Appropriate accountability for the use of government funds to support science is necessary and proper. However, it is not clear that either plan for personnel is appropriate. The National Academy of Sciences, in its business meeting on 22 April 1980, passed a resolution as follows.

> While supporting the principle of accountability for usage of public funds, the National Academy of Sciences views with concern the proposed implementation of OMB revised circular A-21, effective July 1, 1980. Application of these new regulations to institutions of higher learning would further constrain the already limited flexibility in research thrust, increase the administrative burden, reduce morale among teaching and research personnel, and provide a cumbersome, meaningless documentation in terms of percent-of-effort for a continuum of scholarly activities. Moreover, because these regulations would monitor nonfederally supported academic functions as well, inappropriate controls might be exercised. We therefore urge reconsideration of regulations embodied in A-21 and we recommend that the Council of the Academy examine this situation so as to propose appropriate ways of achieving accountability.

My own examination of this situation is reported below. Observe first that circular A-21 covers many different topics in the assessment of costs. Most of these are handled effectively and are not in question here. The difficulty at issue arises only in the new requirement that university faculty report on 100 percent of their activity. This requirement was introduced to provide perspective on the accounting, but in my judgment such "total" activity reporting is a mistake. It requires reports of percentages which are fictitious because of the overlap between teaching and research; such fictions can lead to future conflict. By covering all activity, in teaching and independent research, this rule intrudes government recording on university activity which is not federally funded. Finally, such total reporting is not in keeping with the character of the university; the university does not consist of a set of faculty employees whose time is bought by the administration, but is rather a group of scientists and scholars engaged in free and independent inquiry.

The Grant System

The project grant system for the support of science in the United States was developed after the work of the National Defense Research Council in World War II had shown the national importance of scientific research. Vannevar Bush, in his influential book *Science: The Endless Frontier* (*2*), proposed a National Science Foundation (NSF). When the establishment of such a foundation was delayed, the Office of Naval Research started the system of supporting scientific research by way of grants to institutions on behalf of individual scientists. This system was continued by the NSF on its establishment in 1950. The grants did not support institutions as a whole,

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but supported the research by individual scientists ("principal investigators") and from 1947 included (portions of) the indirect cost to the institution of that research. In this system, grants were based on peer review. Such peer review, at the time of grant renewal, is a form of scientific accountability.

With the development of the system, and with the subsequent constraints on funding, there came to be scientists who needed support from more than one agency, either because any one agency might not have had sufficient funds in the appropriate program, or because the agency program did not have the same range of interests as the principal investigator. Such multiple support of science has strong merits—in particular, the merit of not making the support of novel scientific ideas dependent on the judgment of any one agency. In recent years, with more scientists and further constraints in real government support of science, the tendency for multiple grants to individual investigators has increased. The pressure of such constraints has been confirmed by Philip Handler, president of the National Academy of Sciences. In a recent speech (29 January 1980) he said, "The real resources available to an average American scientist have diminished by a factor of 2 in the last decade."

At the same time, the financial problems of universities have made it necessary for fiscal officers of universities to be more diligent in recovering all costs allowable under government policies, especially by indirect cost recovery and by support of portions of faculty salaries. This has tended to increase the pressure on principal investigators to obtain multiple salary support, such as would be verified under 100 percent reporting.

Indirect costs under the government grants have tended to increase in recent years. In the early days of NSF and the National Institutes of Health (NIH), indirect costs on all grants were computed as a standard figure—15 or 20 percent of salaries and wages. Now these percentages are much higher—50 to 70 percent of salaries and wages. They are based on explicit cost records and vary from university to university. Moreover, cost sharing is now required, on "more than a token basis"—more than 1 percent of total project costs.

This sharp increase in indirect costs has several causes: the effects of inflation on endowments, the drastically increased costs of heating, the increased administration required by a large array of government regulations, and the inevitable tendency of the administrative apparatus to become more elaborate. Thus a combination of circumstances has led to the situation which required that the previous Federal Management Circular (FMC 73-8, dated 19 December 1973) be replaced by the more explicit policy provisions of the new circular A-21. We next examine the background situation to see if there was a need in this revision for the new requirement of 100 percent reporting of professional activity.

Mistakes and Abuses

The project grant system, now very large, has involved a variety of accounting mistakes and actual abuses. Here are some types of these troubles:

1) Inadequate records of transfer of funds.

2) Unauthorized transfer of funds between projects.

3) Charges of equipment to the wrong project.

4) Charges of salaries to the wrong project.

5) Misuse of travel funds.

6) Salary charges for an investigator not actually working.

7) Charges of portions of an investigator's salary to several projects, to a total of more than 100 percent of his or her salary.

Following are some comments on the character (but not on the extent) of these abuses.

Transfer of funds. When unexpended funds remain in a grant about to expire, one may wish to use these funds for related purposes, say for work on a different, but related, project. In some cases, the necessary formal government approval for such transfers can be obtained. However, transfer may sometimes be made before approval is in hand, without adequate record of that approval. Scientists, who tend to think in terms of the common scientific objective of the various projects involved, are not always likely to understand the need for complete accounts of such matters. Auditors are certain, in such cases, to ask for "a complete accounting trail"—often years after the transfer has taken place. Such cases of transfer may thus range from simple "lack of documentation" to severe abuse. The largest accounting difficulties with government grants to universities are said to be with problems of transfer.

Charges to a different project. Many grants are to individuals or to small groups of principal investigators. However, in most cases the financial details of a number of different grants are administered together by a department. Such a common administration has evident advantages in efficiency. It also presents a temptation to "even things up" between grants or to make various small charges to that grant most conveniently available. Sometimes it appears that money from grants in hand may have been used to support a young investigator who does not yet have a grant, or to continue the support of an older investigator whose grant has not been renewed. A principal investigator, part of whose grant is so used, may protest at this misuse of funds intended for his purposes. At one congressional hearing (*3*), two such principal investigators reported such cases and how they had suffered. Other scientists may feel that their projects have lost out because of such incorrect charges to their grants.

Clearly, this type of abuse arises from the use of the individual project system in an environment where scientists work in large departments. This does not excuse such abuse. Since the project grant system gives greater freedom and importance to the individual scientist, it suggests that such scientists should be more careful in checking that the funds granted are used as intended. It also indicates the need for accounting trails.

Multiple salary charges. Since many scientists have laboratories requiring multiple agency support, portions of one investigator's salary may well be charged to several different grants. In one extreme case, 90 percent of an investigator's academic year salary was charged, in amounts varying from month to month, to five different grants. In other cases, the whole of an investigator's salary may be charged to a grant, but the investigator still teaches some courses for the university. Such peculiarities illustrate the real need for accounting records of salary charges on grants. At present, many universities keep a monthly record of percentage of activity of investigators on sponsored projects. In addition, these investigators make a yearly estimate of the percentage distribution of all their activities. Often the resulting comparison of annual to the sum of monthly effort seems to give a total of more than 100 percent.

This comparison has been cited to me as a major reason for 100 percent reporting of professional activity. It seems to be rather an indication of the fictional character of percentage records of activity.

Consulting arrangements. Many university scientists engage in industrial consultation, often to the mutual benefit of the university and of industrial innovation. If the consultation takes place with some other institution also supported by government grants, an individual scientist might be drawing salary from several government sources, which might involve more than 100 percent of his salary. At a number of institutions, the teaching and consulting interests of faculty are balanced by a rule that consulting up to one day a week is appropriate. However, this familiar rule is not free from ambiguity. It is usually taken to mean that one day in seven is available for consultation, but there is another interpretation of "one day in five, plus Saturdays and possibly Sundays." In one case, government auditors complained about the use of the latter interpretation, and the institution returned the funds at issue. Such cases are sometimes publicized as examples of major transgressions requiring more regulation; they seem more like illustrations of the inherent ambiguity of rules, especially rules prohibiting moonlighting.

The problems with consultation clearly indicate the inherent ambiguity in the requirements in circular A-21 about "the employee's obligations to the institution." Consulting rules do not readily cover faculty members who sell real estate on the side or those who write textbooks; it would be hard to distinguish the innovative textbooks from those written just for the royalties. The federal government currently hopes to promote more industrial innovation; should consulting rules be used to constrain the contributions of scientific entrepreneurs to innovative high technology firms? What does one do about consulting done without compensation—such as peer review of projects done for the federal government? The ambiguities about consultation are manifold.

To summarize: with large sums of money involved in government grants, there can be abuses, mistakes, and lack of documentation. Scientists cannot simply take refuge in the assertion that a university is an honest place, or that all the money transferred is used somehow for science. Accounting is necessary for cost transfers, and careful records are needed for salaries charged to government-sponsored projects.

However, none of these various troubles indicate any need for 100 percent reporting of work, and no such reporting by itself will catch any real fraud.

The Central Difficulty

The new OMB circular A-21 was evidently prepared with the good intention of controlling indirect costs and avoiding fraud and abuse—thus providing accountability for the proper use of government funds. However, the part requiring 100 percent reporting is mistaken because it has several grave defects: it is meaningless, invasive, inappropriate, counterproductive, and ineffective.

It is meaningless, because scientific activity in a university involves complex and unpredictable interactions between research, teaching, and other university activities. Teaching an advanced course may suggest ideas for a sponsored research project. That sponsored research project may, in turn, overlap nonsponsored research (departmental research, in the language of the circular). Either research project may suggest better content for future teaching. When a student, who is also on a sponsored project, talks with his professor in the laboratory, that professor's response is both teaching and work on a sponsored project. There is no way of disentangling these and other activities so as to give a meaningful percentage (*4*) for each category of work. Moreover, there is no way of verifying after the fact that such percentages are appropriate.

The total of 100 percent is also not meaningful. Faculty do not have a fixed set of obligations to the institution; instead, there is a general expectation of scholarly effort, not covering any total number of hours per week.

An interpretation (*5*) of OMB circular A-21 by the Department of Health, Education, and Welfare (HEW) stated that reporting of "activity" is synonymous with reporting of "time and effort." It is well established that time or effort reporting for academic staff is meaningless. The requirement of meaningless reports results in numerical fictions likely to lead to future troubles.

The proposal of 100 percent reporting is invasive, in the sense that it suggests and stimulates federal control over those portions of university activity not supported by federal funds. Although the interest of the authors of A-21 is the provision of accurate accounting trails for government funding, their expression of this intent by 100 percent reporting requirements has already led to statements suggesting an improper invasion of university prerogatives. For example, the report of the HEW workshop on A-21, in discussing the monitored workload system, lists six "events" which must be documented; the first of these is a "change in the number or level of courses taught" (*6*, p. 23). The attention here to level of courses taught suggests an invasion of university prerogative, especially since the teaching load assessment of level of courses differs widely between universities. The HEW interpretations of A-21 specifies for monitored workload that the "assignment document shall also describe the assignments in sufficient detail (e.g. specific course, specific administrative assignment, etc.) to support the initial distribution" (*5*, p. 33).

Several government officials have carefully explained to me that these specifications by HEW in (*5*) and (*6*) were not intended to control teaching activities in universities, but were designed only to get careful accounting. Despite the intention, this requirement is out of order. There should be *no* reporting to the government on which courses are taught by whom.

The proposal of 100 percent reporting is inappropriate because it expresses a procurement approach (procurement of research, like that of industrial products) rather than an assistance approach—to provide government assistance to research, as an activity of general benefit to the nation. Recall that the Cooperative Agreements Act (the Chiles Bill), passed 2 years ago, suggested that all federal granting mechanisms be better labeled as either procurement grants or assistance. Recall also that the requirement of cost sharing on grants is intended as an expression of the idea that those grants are to support research desired by the faculty.

Requiring 100 percent activity reporting would be counterproductive, both because it would divert resources to elaborate accounting (a result which is not likely to be effective, in cost-benefit terms) and because it would serve to discourage those independent minds who are attracted to scientific work in universities because that work is free of reporting restraints. Up to the present, there has been no explicit requirement of 100 percent personnel reporting from educational institutions. There are several examples of individuals who have taken other employment or early retirement in order to avoid excessive reporting requirements. Similar effects in the future could discourage the entry into science of independent-minded able people, who would thus not contribute to the national needs for scientific research.

Finally, 100 percent reporting would be ineffective. Study of A-21 reveals that it is organized primarily to provide perspective and an explicit written record (an accounting trail) of all workload assignments. The fictitious character of the resulting percentages may be a possible cause of future conflict. Moreover, giving these explicit percentages does not seem to really address the (unstated) intentions of the circular. Estimated percentages of work will not catch abuses. They are most likely to abuse the time of those innocent of real abuse.

It is also not clear that detailed requirements will hold down the growth of indirect cost. They may equally well lead to more detailed reports justifying the same indirect cost, which will increase in subsequent years by the additional costs of these detailed reports.

To summarize: The requirement of 100 percent reporting produces percentages which are not approximations to real cost, but are fictions. Moreover, these fictions intrude on the university's own responsibilities.

The Agency Role

Time and effort reporting, in this sense, first came into prominence some years ago. In March 1965, the Bureau of the Budget issued a circular A-21 which set forth the "Criteria for Allowability of Costs for Research at Non-profit Institutions." This circular stated that salary costs are allowable only if supported by current reports of time and effort, and specified that these were to be descriptions of the individual's time and effort in three categories of duties: (i) instruction, (ii) administration, and (iii) sponsored research.

These regulations called forth a considerable reaction from the academic community. For example, the Council of the American Mathematical Society, on 29 August 1967, passed the following resolution:

> The Council of the American Mathematical Society urges responsible university officers to take immediate action to have Time and Effort Reports and similar documents pertaining to faculty members' time eliminated, because it considers that such documents are incompatible with academic life and work. The Council reiterates the traditional view that teaching and research are inseparable, and that accounting procedures in universities must take account of their unitary character.

As a result of many such observations, the government established an interagency task force, chaired by Cecil E. Goode, which reported, inter alia, that "Time and effort reports now required of faculty members are meaningless and a waste of time." As a result, the Bureau of the Budget issued, on 1 June 1968, an amendment of this circular A-21:

> The principal purpose of this amendment is to eliminate the time or effort reporting requirements set forth in that circular. In substitution therefor, charges to federally sponsored research projects for personal services will be supported by the institution's normal time and attendance and payroll distribution systems, and by stipulated salary support amounts as specifically stated in research agreements.

In the event, this method of "stipulated salary support" has been little used—perhaps by one-half of one university. Other universities had tried to use it, but the accounting agencies raised so many difficulties about stipulations made long ahead of time that the universities gave up trying, and instead used the alternative method called "certification of payroll distribution." The circumstances have been described in some detail (*7*). This experience indicates that difficulties can be caused not just by the text of the regulations, but also by the way they are administered.

No 100 percent report had been mandatory under previous versions of circular A-21, although some universities, under pressure from accounting agencies, have already used 100 percent reporting for professional time—and some state universities require accounting for time spent on teaching.

The new version of circular A-21 was published in the *Federal Register* in preliminary form in March 1978 (*8*) and in final form on 6 March 1979 (*1*). As originally proposed, it caused considerable concern among universities, so there were meetings with university groups, individual university officials, and other interested parties. Unfortunately, none of these meetings involved any real representation from the working scientists.

The negotiations about circular A-21 were unsatisfactory in other respects. The monitored workload plan had originally been proposed to OMB by the Committee on Government Relations (COGR) of the National Association of College and University Business Officers (NACUBO). This original version did provide for percentage reporting of activity, but apparently did not involve 100 percent reporting of time of professionals. This version was changed by OMB in at least six regards. Two important changes are these: the original monitored workload was to apply to both professional and nonprofessional staff and the original allowed for after-the-fact computaton of indirect cost items like departmental administration.

The new circular A-21 deals with many other problems. In addition to activity reporting there are a number of new features. Professionals report activity once each academic period, not once each month, and indirect cost is computed not as a percentage of salaries and wages, but as a percentage of modified total direct costs.

These discussions (1976 to 1979) of the proposed new circular A-21 apparently never raised the fundamental question about the use of the new requirement of 100 percent reporting of faculty activity. This is a strange omission, in view of the previous emphatic expressions of difficulty with the earlier, but comparable, idea of time and effort reporting.

To my regret, the university officials involved in these discussions did not catch this omission; moreover, as noted above, working scientists were apparently not involved. The presence of this 100 percent requirement was first noticed late in 1979 by Professor Serge Lang at Yale; since that time concern has mounted. In this way an unfortunate requirement has been placed on university faculty without adequate consultation with that faculty. The rules of the new circular A-21 are applicable now (more exactly, are applicable for each university at its first fiscal year beginning after 1 October 1979). Despite this plan, it is to be hoped that the previous regulations can be used for the time being to allow for adequate consultation and adjustment before the new regulations are actually implemented.

Indirect Costs

Accounting carefully for professional work (or activity) charged directly to government grants and contracts is appropriate and straightforward, but not always simple. All the complications and injustices of total reporting derive from the desire to account for professional work charged at various points to cost sharing and to indirect costs. Hence, to understand the situation and the alternatives which might be possible, one should understand how indirect costs are handled.

Congress has expressed concern about indirect costs. A 1976 conference report on an appropriation bill states (*9*):

> The conferees reaffirm the language of the House report calling on the Department to bring the spiraling indirect cost rates under control. The conferees are concerned over the substantial sums ostensibly appropriated for activities authorized by law, but which are in actuality being diverted to pay overhead costs of universities and other recipients of federal grants. It is thus imperative that the Department work closely with the Office of Management and Budget and other Federal agencies, to undertake revisions in the indirect cost mechanism which will result in a significant reduction in funds being diverted into indirect costs.

This report apparently did not call for 100 percent reporting for personnel, and other congressmen are said to have less drastic opinions about controlling indirect costs. However, these problems were a major motivation for the new A-21.

Circular A-21 contains an essentially

complete description of how to calculate indirect costs of federal grants to educational institutions. The description, however, is couched in heavy bureaucratic language and distributed over many different pages of the document, with no clear summary. To help the reader to penetrate this morass of official prose, I offer here my own summary.

Major functions of an institution. The costs of running educational institutions are ultimately allocated to five major functions, as follows:

1) Instruction: all teaching and training activities.

2) Departmental research: all R & D activities not separately budgeted or accounted for (this is subsequently combined with item 1).

3) Organized research: all R & D activities separately budgeted or accounted for—both those sponsored by federal agencies and those sponsored by nonfederal organizations.

4) Other sponsored activities: all work other than instruction or research financed by federal agencies or by other outside organizations.

5) Other institutional activities: residence halls, dining hall, and so on.

The circular then goes on to describe costs, first direct costs and then indirect costs. An indirect cost is one that cannot be specifically related to a particular sponsored project, instructional activity, or the like. There are defined eight categories of indirect costs: depreciation and use allowances; operation and maintenance expenses; general administration and general expenses; departmental administration expenses; sponsored projects administration; library expenses; student administration and services; and offset for indirect expenses otherwise provided for by the government. Each initial cost to an institution is assigned either as a direct cost to a major function or as an indirect cost to one of these eight categories. Within each indirect cost category there may be cost groupings, with like costs grouped together, to provide for selective distribution of costs to the different major functions.

After such groupings may have been made, the indirect costs are allocated or distributed to the major functions. There are rules for this distribution. An indirect cost which is allocated uniformly to all major functions is distributed between them in proportion to the "modified total direct costs" of these functions. This modified total, as defined in the circular (*1*, p. 17), consists of all direct costs, omitting that part of subgrants and subcontracts over $25,000, therefore presumably omitting that part of equipment expenses individually larger than $25,000. Some other indirect costs are distributed selectively according to appropriate rules. Thus indirect costs for departmental administration are distributed between the functions "instruction" and "sponsored projects" in proportion to the ratio of sponsored project costs to total departmental cost. Indirect costs are distributed seriatim: for example, the general administration costs are first apportioned to the individual departments, and are then distributed as above.

After the indirect costs have been distributed to each function, one is said to have a "cost pool" of indirect costs for that function. The indirect cost rate for that function is then determined as the following percentage: indirect cost pool over the modified total direct cost of that function. This, subject to the inevitable adjustments, gives the final indirect cost rate, say the rate for sponsored projects of a specified type. This is the indirect cost rate applied to each sponsored project, or to each sponsored project of a specified type.

In these indirect cost computations, the charges for professional or professorial time appear in section F, "Identification and assignment of indirect cost," under the following headings:

> 4.a. Departmental Administration Expenses. Salaries of professorial or professional staff, whose appointment . . . requires administrative work that benefits sponsored projects.
>
> 5.a. Sponsored Project Administration. The salaries of professorial or professional staff whose appointments . . . involve the performance of such administrative work.
>
> 7.a. Student Administration and Services. The salaries of members of academic staff whose academic appointments . . involve the performance of such administrative or service work.

This concludes our summary of the computation of indirect costs.

On this analysis, what is really required for proper accountability for government funds is a report on those portions of the salaries of professorial or professional staff to be charged either directly, or indirectly, under one of these three rubrics. This could be accomplished in many other ways.

This analysis also indicates some of the inherent uncertainties and ambiguities in any calculations of such indirect costs. As circular A-21 states, these are costs which "cannot be identified readily and specifically with a particular sponsored project, an instructional activity, or any other institutional activity." The individual scientist may not recognize that these costs are there; in some cases they may not affect his project much. They are average costs, not marginal costs. A university might well undertake *one* additional scientific project without any visible addition to its indirect costs (that is, zero marginal cost), but on the average these costs are surely present.

They are also ambiguous. In the indirect cost computation, it is important to have the correct "base"—the direct cost of each sponsored project. Hence, officials intend that these costs include all professorial time devoted to the project—not just the percent of salary charged directly to the project, but the percent of salary which corresponds to all the actual work on the project. However, for most scientists, sponsored projects overlap other sponsored projects and other unsponsored work (so-called departmental research), so there simply is no clear percentage of work devoted to each project—and no way in which this regulation, or any regulation, can identify the work or effort of scientists on each and every project. They overlap; they are indefinite; they involve new ideas which are not classified by projects.

To summarize, the 100 percent reporting requirements have been included to cover indirect costs (and also items of "cost sharing"), but indirect costs are intrinsically just estimates. A recent General Accounting Office report (*10*) reads:

> Indirect cost rates at educational institutions are based on arbitrary methods and judgemental factors which make the evaluation of such rates very difficult. As a result, it is difficult for the Federal Government to "assure itself that charges for such costs are reasonable." . . . There is probably no feasible way for determining indirect costs that is both simple and reasonably accurate.

Nevertheless, effective figures for indirect costs are and will be essential. This depends on real agreement and careful execution by administrators on both sides.

Alternatives

The National Commission on Research was set up several years ago as an independent but temporary organization. The first of its five reports (*11*) deals with the problem of accountability; a summary of this report has appeared (*12*). Two recommendations of this report read:

> 4. The Commission recommends a simpler and less costly method of effort reporting based on responsible self-regulation: the explicit certification by individual investigators

> that direct salary charges to their research agreements are reasonable and fair, coupled with the federal programs officer's review of the reasonableness of these expenditures for the work undertaken.
>
> 5. The Commission recommends that government agencies and universities construct an option, analogous to the 'standard deduction' in income tax calculation, to charge activity which is treated as indirect costs under sponsored agreements. The fixed percentage would be negotiated. It might either be uniform or vary from institution to institution. Some universities would not receive full credit for their allowable indirect costs. However, accountability would be fully served and both government and universities would reduce the burden of detailed accounting and audit.

These recommendations clearly recognize the important point of separating the accounting for direct costs—which do require the attention of the scientists involved—from the accounting for indirect costs. There can be other specific proposals for such separate consideration. Here is one:

Direct fixed cost plus sampling on indirect costs. On government grants and contracts, arrange that the salaries of principal investigators charged to direct costs be treated as fixed-cost grants. This would replace audit by scientific oversight, which would normally be accomplished when proposals are submitted for renewal of the grant through the judgment by program officers in agencies as to the effectiveness of the direct-cost work of the investigators.

Under indirect costs, arrange a negotiated rate for each university for each of the indirect cost categories involving personnel services, such as the category "departmental administration" (*13*). Data presently available in most universities should yield estimates of these indirect cost rates. They could then be renegotiated from time to time: this renegotiation could be based on suitable samples of such costs.

There are many other possible arrangements. For example, as the Association of American Universities has proposed, indirect cost rates involving personnel services could be based on careful samples of actual time spent in different categories of indirect cost. Such explicit samples should yield much more exact information than overall percentage reporting. Another proposal, from the National Commission on Research, suggests experimentation with a different funding mechanism: grants-in-aid, using an award made in response to a normal proposal including a detailed budget, with federal responsibility limited to scientific reporting and the fiscal management delegated to the institution (*14*).

Since the analysis and detailed specification of these and other alternatives require careful thought, more time is needed for this analysis. All the parties involved should be consulted: Congress, government officials, university officials, and university faculty.

We urge that initially the OMB announce that, for a period of 2 years, universities and other educational institutions are authorized to employ alternative plans, both plans to be specified by OMB and plans proposed by universities and other institutions. Experimentation with these alternatives would then allow for formulation of such alternatives in a modified circular A-21. Such a modified circular could provide a greater variety of methods of accounting to suit the variety of universities.

Concluding Remarks

Long ago, the government chose to support research in science and technology at universities in order to further new discoveries which would help both our own country and the whole of mankind. This support goes to members of the academic community. This community can and must apply high standards of accountability for direct expenses of travel, equipment, and the like. However, for this community, time spent on research in its manifold forms is not accurately accountable, so that any system of percentage reports is sure to involve artificiality, and therefore ultimately to lead to additional abuses. Our examination in this article has shown that 100 percent reporting of activity is not a requisite or effective means to control abuses, or to meet the needs of the granting agencies, or to control indirect costs, or to meet requests of Congress. This total reporting is simply a mistake. It makes for constraints counter to the spirit and intent of those who struggle to discover new results. These constraints will diminish and divert the very scientific progress for which the monies are expended.

Scientific research in universities is firmly based on the independent initiatives of professors and scientists. Unfettered search for the truth has benefited and will benefit the nation, and has deserved and will deserve strong government support from public funds. The central tradition to be supported is the independence which attracts original minds and which cannot be subdivided into individual projects. Hence, with the 1968 interagency task force, we can say, "Time or effort reports now required of faculty members are meaningless and a waste of time."

References and Notes

1. Office of Management and Budget circular A-21, "Cost principles for educational institutions," *Fed. Regist.* 44 (No. 45), 12368 (6 March 1979).
2. V. Bush, *Science—The Endless Frontier, A Report to the President on a Program for Postwar Scientific Research* (Government Printing Office, Washington, D.C., 1945; reprinted, National Science Foundation, Washington, D.C., 1980).
3. U.S. House of Representatives, subcommittee of the Committee on Government Operations, *Hearings on Accountability of Educational Institutions for Federal Funds and the Effectiveness of Federal Auditors* (96th Congress, 1st Session, 17, 18, and 19 July 1979; Government Printing Office, Washington, D.C., 1979).
4. Here it might be objected that lawyers and others (for example, plumbers) do record time spent on tasks. The comparison is not relevant, because their tasks are of uniform character (always advising a client) and because the record is made as the basis of a charge—an explicit charge for profit.
5. "HEW interpretations on OMB circular A-21, revised March 6, 1979. Cost principles for educational institutions" (mimeographed, Office of Grant and Contract Financial Management, Office of the Assistant Secretary for Management and Budget, Department of Health, Education, and Welfare, Washington, D.C., 11 December 1979).
6. "A workshop on OMB circular A-21, revised March 6, 1979. Cost principles for educational institutions" (mimeographed, Office of Grant and Contract Financial Management, Office of the Assistant Secretary for Management and Budget, Department of Health, Education, and Welfare, Washington, D.C., revised 2 January 1980).
7. *A Report of the Commission on Federal Paper Work (Education)* (Government Printing Office, ed. 8, Washington, D.C., 1977), vol. 3, p. 19:2.
8. Office of Management and Budget Circular A-21, *Fed. Regist.* 43 (No. 48), 9896 (1978).
9. *Congressional Record*, 3 August 1976, p. H8269.
10. "Federally sponsored research at educational institutions—A need for improved accountability" (report PSAD 78-135, General Accounting Office, Washington, D.C., 18 August 1978).
11. "Accountability. Restoring the quality of the partnership" (National Commission on Research, Washington, D.C., 1980).
12. National Commission on Research, *Science* 207, 1177 (1980).
13. It has been observed that related ideas for the consolidation of overhead functions have been encouraged by the Administration, and experiments of such sorts by NIH and NSF have been expressly mentioned in the President's Science and Technology Message and in many statements from the Office of Science and Technology Policy.
14. *Funding Mechanisms: Balancing Objectives and Resources in University Research* (National Commission on Research, Washington, D.C., 1980).
15. In preparing this article, I have had the advantage of consulting a number of government officials, university administrators, and university scientists, none of whom has any responsibility for the opinions I express. They include Richard Atkinson, Thomas Bartlett, Newton Cattell, Cedric Chernick, Albert Clogston, James Coleman, Kathleen Edwards, Donald Fiske, Donald Fredrickson, Jerome Fregeau, Hanna Gray, Robert Green, D. Gale Johnson, Philip Handler, Donald Kennedy, Henry Kirschenmann, William Kruskal, Serge Lang, Gerald Lieberman, John Lordan, Richard Meserve, Diane Patten, Frank Press, Leonard Redecke, Robert Sachs, Greta Schuessler, I. M. Singer, Philip Smith, Joseph Warner, and Linda Wilson.

NATIONAL INSTITUTES OF HEALTH

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40th MEETING OF THE
ADVISORY COMMITTEE TO THE DIRECTOR

- - -

May 13 and 14, 1980
Conference Rm 10, Bldg 31C
National Institutes of Health
Bethesda, Maryland

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PROCEEDINGS

May 13, 1980

9:00 a.m.

DR. FREDRICKSON: Good morning, ladies and gentlemen. Welcome to another meeting of the Director's Advisory Committee, an ordinary meeting in the sense that the apocalypse is commonplace. The issue, technically, today is the matter of determining the costs of research and accounting for the total efforts of scientist-academicians. Perhaps if I can steal a line from Jim Kelly, it may be the issue of accounting versus accountability in one sense. If it is unusual to bring this issue to a sharp focus, we may well note that the Director's Advisory Committee over the past four years has dealt with the unusual and extraordinary on many occasions. This is the setting where the proposed NIH Guidelines for Recombinant DNA Research were first given a public airing.

The Committee has played a key role in the development of principles for the funding of health research, and its last meeting, as you will remember, dealt with the difficult problem of attempting to stabilize the Federal support of research in the biomedical sciences.

This meeting will deal with a topic that is much deeper than even some of the other issues I have just mentioned. We are not necessarily talking about the final confrontation between the state and science or the last chance to stop the fatal split between the Federal Government and the American universities, but we are talking about some interdependent forms of human endeavor that are in trouble with each other; and one feature of this meeting which is unusual is that it attempts to bring together in the same room a number of people who rarely all speak in the same forum on the same day.

At this meeting I certainly don't expect us to solve the problems we will be talking about, but I do hope that we can share some perceptions of the problems faced and agree on a few small steps to bring us closer together in understanding, and prepare for future proceedings here and elsewhere on this important subject.

Part of the idea grew out of a meeting the American Association of Medical Colleges held not too long ago which some of us attended. I think that very brief meeting helped us phrase some of the issues that are before us today and to select a variety of people from many corners to help address and bring together divergent views.

We have provided you with a number of materials in the briefing book. It is an eclectic array, taking different sides of the problems that we will be talking about today. We will hear more directly about the National Commission on Research report which was released in March of this year, the one entitled "Accountability: Restoring the Quality of the Partnership." OMB Circular 21 is also featured--too much for anyone to read who hasn't read it, but many of us here already have; and I want to thank Dick Powers of the NIH staff for his brief and useful precis.

In addition to that are contributions from others, some of whom are participants here. You have also received some handouts this morning. Dr. Kenneth Brown has handed us one from the University of California. His presentation will be the first today, along with Dr. Krevans. Linda Wilson has handed out some materials, and perhaps you will come back to these later, Linda, and describe what they are. We do provide here an exchange for all kinds of views and papers. We welcome the opportunity to distribute them; but much of our exchange today will be verbal, and it will be extended by closed-circuit television because this meeting is much oversubscribed.

That being the case, and in the interest of the unities of the telecast, I will just start from a convenient corner and go around the table, rather than introduce the members of the DAC and then the participants.

On my left is Dr. William Raub, who is the Associate Director for Extramural Grants and Training. Bill Anlyan, the Executive Vice President from Duke University Medical School. Mr. Henry Kirschenmann is the Director of the Office of Grant and Contract Financial Management. This is the first time that Mr. Kirschenmann and I have ever met. It is a pleasure to have him here.

Next to him will be, later this afternoon, Fred Bohen, the Assistant Secretary for Management and Budget; he couldn't be here the first thing this morning. Then, Dr. Chien-Shiung Wu, a member of the Director's Advisory Committee and Professor of Physics at Columbia. Next to her is Leon Eisenberg, Professor of Psychiatry at Harvard, another member of the Committee, and I regret to say attending his last meeting before his time is up on the DAC.

David Kipnis is Chairman of the Department of Medicine at Washington University in St. Louis; and next to him is Bill Danforth, the Chancellor of Washington University. Stuart Bondurant is another member of the Director's Advisory Committee. He is now the Dean at Chapel Hill Medical School. John Sherman has been many times at this table in a number of roles, but now he is Vice President to the Americn Association of Medical Colleges. Next to John is Kenneth Brown, who is Professor of Physiology at the University of California in San Francisco;

and next to him is Dr. Julius Krevans, who is the Dean of that school.

Barbara Hansen is a member of the Committee. She is Associate Dean for Graduate Studies and Research in the School of Nursing at Ann Arbor. Warren Bennis is a research Professor at USC who hides out in Sausalito and gets such an enviable tan before these meetings. Then, Francis Abboud, Professor and Head of the Department of Internal Medicine at the University of Iowa; and next to him, Jack Eckstein, Dean of the College of Medicine. We welcome you both as participants.

James Kelly, very recently Executive Vice Chancellor of SUNY and before that, in another incarnation, as the Comptroller of the Department of HEW. We are very glad to welcome you back, Jim. He is in a resting phase. Lord knows what will be the next.

Estelle Ramey, Professor of Physiology at Georgetown University, is a new member of the Director's Advisory Committee. We welcome her this morning to her first meeting. Next to her is Howard Temin, Professor of Oncology at the McArdle Institute in Wisconsin, also a member of the Committee. Linda Wilson is the Associate Vice Chancellor for Research from the University of Illinois in Urbana. She is here as a participant. And next to her is Mr. Henry Meadow, a Dean for Special Purposes, Projects and Planning, at Harvard.

Finally, but not last, is Ivan Bennett, Acting President of New York University, a long-time and valued member of the Director's Advisory Committee. And next to me is my right arm, Joe Perpich, who is the Executive Secretary of this Committee.

Well, this morning, then, we are going to take up some problems that finally bring us into the big time, after the practice this Committee has had in the past. These are problems that have been around as long as there has been Federal funding for biomedical research, indeed for R&D; and the problems we are going to talk about are not exclusive with health science and its support, but they represent problems of all kinds of government support of research and development. I think the NIH, providing some 36 percent of all R&D monies to academic institutions, is an appropriate place to begin a discussion of these problems, particularly as they relate to our own programs.

I have already given you one of the dread words--"accountability"--and the other today will be "indirect costs". These two issues are going to be considered and analyzed separately, but they will come together a number of times, because they interact with a range of competing interests.

Now I accept the risk of oversimplification in identifying four groups that are facing each other today. That is more than the two that we sometimes hear have partnership problems--the Federal Government and the universities; but actually, each of these vast and important institutions has two parts.

On the one hand, in the Federal Government, we have program managers, and on the other we have auditors and accountants and those who seek to keep track of the costs and uses of funds which the program managers disburse. In the universities, we have not one single community but sometimes two or more. Identifiable are the research institution administrators and the research scientists.

Thus, we are not two parallel lines facing each other, but at least a square. We can distinguish, then, multiple areas of tension and potential conflict, and sometimes we have perceived--and we will see it again and again--a lack of sufficient communication among all the participants.

There is an interface where the demand for fiscal accountability beats against a kind of maximum desire for flexibility and a minimal bookkeeping. Here, I think, is a sort of aggregate Federal view that is arrayed against an equally aggregated university view. But secondly, within research institutions, there are tensions that arise between administrators and research scientists--the administrators on the one hand insisting that, except as otherwise agreed, all research-related costs must somehow be met by the Government patron, and the scientists on the other hand, who sometimes insist that funds provided for the support of research must not be diverted to purposes that are not clearly research. Third, there are tensions that build between Federal auditors and Federal program managers when demands for accountability seem to interfere in many ways with the accomplishment of program missions.

I think also we have failed in the past to see how the agencies that deal with research and development are so structured that they create many problems that might be avoided were there to be some modification of their approach; and I refer here, for example, to the categorical nature of many of the missions and programs of the NIH, versus the question of support for institutions or a broader instrument. But certainly one of our great problems has been the trouble we have had in getting together, the lack of opportunity to appreciate the perspectives that each of us has held, and this is what today's meeting is really all about. We are in search, at least, of some kind of elusive understanding. I think consensus and resolution of the problems will have to await another day.

Now, in developing our agenda we have tried to engage a diversity of interests and perspectives within the Government, the universities, the research community; and a special feature of the program will be presentations by investigators and administrative people from three institutions, at the least; and in our day-and-a-half meeting today and tomorrow morning, we are going to examine the real costs of doing health research from the standpoint of the scientist and the administrator. We are going to deal with Federal perspectives on cost and accountability issues, particularly in relationship to OMB Circular A-21 and we will review the recommendations of the National Commission on Research, which has recently completed an extensive examination of accountability at academic institutions and has said some important things on the broader issue of this Federal/university/science relationship.

Some of the very specific questions which will need to be examined today are the question about Federal documentation standards: Are they reasonable for the use of research funds at academic institutions? Are they just needlessly cumbersome and indeed incompatible with the university environment? Has the rapid rise in the indirect costs of doing research reduced funds that are directly available for research--a key problem because of this year's effort to provide for stabilizing one aspect of research funding at the NIH--one addressed largely to assuring the participation of a number of scientists under research grants? This view posits a pool of money that will be available for scientists and institutions in proportions to the way it is used to fund direct or indirect costs.

Do adequate incentives exist to keep costs at a minimum? What are the bases for assertions that there have been funds diverted from authorized research projects? Are current Federal regulatory practices unreasonably burdensome for academic institutions? Are they retarding the progress of research in this country?

Today in the "Washington Post" is an op-ed piece by Dan Greenberg, that oft-Cassandra-like voice, who talks about the Russian jump in teaching calculus. But it isn't the teaching of mathematics and calculus that really determines the primacy of a nation; it is the creative use of those subjects and those disciplines in scientific research. And there are many who believe that this nation falls backward with each month, each year; and some believe that a partial cause of that is the relationship that we have established among ourselves--the Government and the universities.

Does current research support really fit the ongoing way that research is being accomplished? How much can we go toward self-regulation in a better way? Is the time opportune to fashion a new kind of research compact between the Federal Government and academia? I think we are ready to begin addressing some of those issues.

Before I do, I should tell you that Jim Kelly has, in addition to his place on the announced agenda, agreed to listen carefully and provide a summary of his impressions at the close of today's meeting. I should also note that there are many other people who are in attendance today, in addition to those around the table. There are members of the NIH staff, of course, and many who are listening at other posts, watching us on closed-circuit television. The HEW Steering Committee, which has been grappling with overall health research planning. The Federal Council for Science, Engineering, and Technology has some members of its committees here. There are a number of organizations represented--Congressional staff, the Office of the Inspector General of HHS is here.... Others expect to come in and out. Finally, we are glad to welcome some members of the press.

DR. EISENBERG: All that is said will be in confidence.

(Laughter.)

DR. FREDRICKSON: Well, I think it's time to get on with the agenda, unless there are any questions about today's proceedings.

We have asked three groups of participants to do a very difficult thing today. Obviously, there is no ideal way to accomplish the task that they have generously agreed to set out to do, but we've asked a scientist and an administrator (often a scientist who has ascended to other spheres)--we have asked these people representing the laboratory and the place in which the laboratory is set to give us three examples of NIH-supported research at their institutions. We've asked them to address direct costs and then indirect costs, and to start, at least, around a single instrument or some simple post around which we might all revolve; but they are allowed, within the meager time they've been alloted, to give also some broader impressions that they have about the process; and I herewith invite them also to join the rest of the general discussion, of course, throughout this meeting.

We will hear from the University of California in San Francisco, Dr. Julie Krevans, the Dean, and Dr. Kenneth Brown, the Professor of Physiology there. I think we're going to hear from Dr. Brown first. Dr. Brown is a member of the National Eye Council, a council which took up with much concern the question of indirect costs in the funding of research in the Eye Institute; and he has done a great deal of thoughtful analysis and has some strong and interesting opinions that I am very glad he has agreed to share with us.

His paper is to be found in the briefing book, a paper he provided before this meeting was actually set. Dr. Brown?

DR. BROWN: Well, I'd like to comment first that I have had the impression for a long time that two of the groups that are most intimately affected by the entire matter of indirect costs are groups that until recently have had very little to say and certainly no control over this matter. Those groups are, first of all, the granting agencies, such as NIH through its various institutes, and, secondly, faculty members who are principal investigators or prospective principal investigators on grants. So perhaps it is significant that my first acquaintance with this issue was through my membership on the National Advisory Eye Council, because the Council became quite concerned with what we perceived as the impact that the increased direct costs in recent years have had upon the funding of research through the Eye Institute and, thus, through NIH.

Our final statement on that matter is contained in the document which Dr. Fredrickson referred to. In that document we made a very strong attempt to outline the problems as we saw them from the standpoint of the Eye Institute, and the reasons why we see those problems as important, and some of the issues that we feel need to be addressed in solving them.

So perhaps it is also significant that today I am before you on the other side of that issue as a principal investigator, and as I understand it, our task is to use my grant as a very small sample of the grants at UCSF, and more generally at the University of California, and to use this to indicate how the University uses grant money in both direct and indirect costs.

First, I should perhaps comment on the ways in which my grant might not be representative and the ways in which it is. It certainly isn't typical in the sense that it is one of the largest grants supported by NEI, and it is also one of unusually long standing, being now in its 20th year; but these are perhaps advantages from our present standpoint, because this has given me an unusual opportunity to become acquainted with the ways in which direct and indirect costs--well, especially the direct--are handled at the University of California.

There is another aspect to this: Since the grant has been in effect for quite a long time, the distribution of funds among the categories at this point is affected by that. In relatively new grants, of course, there is usually a lot of money and equipment and relatively little in salaries. My own grant is very largely in salaries now and very little in equipment, and I don't know whether the kind of work conducted is germane, but I think that the kind of work that is done under my grant is quite typical of what is supported by the Eye Institute, and also the type of work done on campus. It is microelectrode work in studying the processing of retinal signals, and this is the kind of work that is supported a great deal by NEI, and I think it's typical of the kind of basic research in support of medicine that is done at UCSF.

Now, on our major issue today, which is the policies governing the spending of funds, my grant, as far as I know, is entirely typical in that respect, because I think that the policies that are followed are uniform among grants on our campus, and I am also informed that they are quite uniform between campuses.

May we have the first slide?

(Slide.)

I have also made copies and given you handouts so that you can look at this information at your leisure.

DR. FREDRICKSON: You all have a copy of this at your place.

DR. BROWN: Yes. This slide shows on the left side the direct costs listed in the way they are normally listed in a grant application, and on the right we have the indirect costs.

Now, some of the items here I don't think are of particular interest to you, so I would like to go down and try to hit just those things that would seem to me to be of special interest from your point of view. I suppose the very first item would have to be that of the salary of the principal investigator. This is of interest, of course, because when you have tenured faculty who are on grants and a part of their salary is supported from the grant, then the university is getting a considerable financial advantage there, which is in addition to the direct support of research under the grant, because that is a salary which the university would have to pay were it not for the grant being in effect.

Now, as I understand the policy of NIH, the principal investigator can charge his time to the grant up to the full percentage of time that he actually contributes to the grant; and it is also the policy on our campus, as I understand it from Mr. Littlejohn, Dr. Krevans' associate, that investigators should charge up to that percentage to grants. However, this is a request, not a demand, and in my own case, as in a number of other cases, I feel quite uncomfortable in charging the full percentage of time that I put on the grant for this purpose; so, in fact, I charge much less than that to the grant, and in fact, the university pays for almost as much of the time that I put on my grant as NIH does.

Incidentally, those salaries you see there, I should point out, include both the salaries and the fringe benefits. The salaries at the University of California are not quite that high.

Now, going down the line, we have one and a half assistant research physiologists. These are professional physiologists, specialists, staff research associates, which is a euphemism for a lab tech at the University of California. Now, going quickly from that point down, I think we should next hit the "other" category, because here we come to something very important:

On our campus, it is the policy that all services, whether departmental in nature or campus-wide, if used in the conduct of grants, should be paid for from the grants on the basis of the actual usage of the services. Now, under the "other" category, what we see here are three services--namely, that of our departmental electronic shop, our departmental machine shop, and secretarial services--which are paid for out of my grant in the proportion of time that those services are actually used. So these are the kinds of things that under some circumstances one might envision being part of indirect costs, but which are, in our case, treated as direct costs.

Going to the more general situation of campus-wide facilities, we also make use of a number of those, and they are paid for similarly on a recharge basis. The only one that appears here as a line item is under supplies where you see animals and animal care. Animal care is paid for on a per diem basis for the animals that are actually cared for. Other campus services that we use are things like photographic and medical illustration services for making illustrations for papers and talks. We have a scanning electron microscopy laboratory, which I use a great deal, and all of those are paid for on a recharge basis.

Again, I understand from Mr. Littlejohn in Dr. Krevans' office that the recharges are set so that we, in fact, are paying about 75 percent of the total cost of those services, the other 25 percent being subsidized, or whatever is the correct word, by the university.

There is only one other item I think might be germane here, and that is the item of telephone service. One might think of that also as something that would normally be under indirect costs, but we treat that as a direct cost. I have two telephones which are used primarily for grant purposes, and those are paid for out of direct costs, although they do not appear as a line item here.

So, in summary, I think what I should say is that on our campus, probably the most significant policy that I should tell you about in connection with the direct costs is that all items that are properly attributable to direct costs are, by policy, treated as such and are charged under the direct costs of the grant. I think that's the main item of policy which is important in this respect and which would have to be understood in evaluating the indirect costs at our campus.

DR. FREDRICKSON: Julie, I think that it would be appropriate now for you to take up the indirect costs, if you will. Dr. Krevans.

DR. KREVANS: I have never witnessed such an unfair procedure: to let Ken Brown talk about microelectrodes and retinal signals, and I have to talk about police, garbage, and sanitation to this audience. (Laughter.) If we could have that slide back quickly, I will run through what Ken and I both learned.

(Slide.)

First, let me remind you, the University of California is a multicampus system with nine campuses, and the university and the Government have agreed that the indirect costs for the University will be negotiated as a total-campus system, so that the figures agreed upon by the Government and the university are averaged. There is a general policy of the university for making maximum campus autonomy, and it is therefore no surprise that the campuses vary enormously in what they provide out of central costs. At Santa Barbara, I think they provide a sedan chair for each of the individuals who do research. We are somewhat more austere in San Francisco. If the campuses each had an indirect cost negotiation with the Federal Government, my guess is it would vary almost threefold from the lowest to the highest campus.

The figure that has been agreed upon between the Government and the university runs as follows--and these are the major categories, and we have applied them to Ken's grant: Maintenance and Operation of Plant at 4.68 percent, and that's just what it says it is. Some of these words are peculiar. Building-Use Allowance is, I guess, a translation of what in other categories has been called depreciation--and this, again, is an agreed-upon relationship for buildings that were not built with Federal funds, I am assured, and which are allowed to be costed out for their potential replacement need.

The Equipment-Use Allowance is limited to equipment purchased by the university for the support of research which is greater than $500 per item; and again, a percentage figure is reached for the campus-wide system.

General Administration refers to the administration services attributable to the support of the sponsored research effort, which takes place in the system-wide administration and the campus-wide administration. I was thrilled to discover that the Dean's office is included with the Departmental and Principal Investigator Administration. It is the first time I have found myself in the right box on a campus-wide decision. But into that goes a figure calculated on the basis, again, of a negotiated arrangment with the Federal auditors for the cost allocation of the President of the University of California's office and the Chancellor's office.

When we got to this figure, both Ken and I were curious as to how that was done. It turns out that the general principle which has been agreed upon by the Government and the university is that dollars are used as a surrogate for effort; so that if a program costs so much and the dollars that are being spent on that program are 40 percent of the total being done in that office--let us say, being spent on sponsored research--and 60 percent of that particular office's obligations for effort are in relation to the educational program, that 40 percent becomes the surrogate for a time-study calculation for effort; and that general principle holds for a whole variety of these categories.

The libraries, again, are done by surveys, and then an agreed-upon number is arrived at. Departmental Administration includes the efforts in the Dean's office, the department offices, secretaries, other nonacademic personnel, and the administrative time of faculty who, again by survey, have indicated how much time they spend in research administration. All of that is lumped together under Departmental Administration. The student services are basically the fringe benefits and the usual student support systems that are given for students who are in the dual role of being supported for their participation in research. And this, basically, is how the indirect costs are calculated.

Now, these figures are all based on costs incurred in 1975-76. The university was in the midst of negotiating a new set of figures last year, which would have called for a dramatic increase in the indirect cost rates. The faculty were very concerned, and so they have put off this painful process until they are a little older.

I would like to just make one or two general points about the complexity of this issue, with a kind of a plea that we don't try to find a simple answer. As I was listening to our system-wide administrators explain this, they use as their introductory model a very simple explanation: that administration of the educational program of a university is basically supported by, if you will, the student money, in which case it is very minor student fees--in the University of California, the state appropriations, endowment, et cetera; and the administration of the sponsored research support and all that goes into it is supported by the indirect cost, which is charged to the sponsors of research.

Now, the simple way to handle this would be not to mix them--to have separate buildings, separate faculty, have one group of people who do nothing but teach and another group who do nothing but research--and then we wouldn't have these complicated conferences or try to figure out percentages--and I also think we would have rotten educational programs and rotten research.

I think the power of the university's contribution to research comes in this complex role of the faculty, where they are partly teachers, partly researchers, partly administrators, and even occasionally partly governors of their institutions; and despite its complexity and the troubles, I would hope that when we come all out of this, you maintain that as a central desirable feature: the mixed role of faculty in this process.

The points that Dr. Brown and his colleagues brought up in the paper which they have distributed, I think are very important to read. I think there is a very serious disenchantment of the faculty, particularly with what they perceive to be this cloudy curtain between them and something that happens to money which is generated by their effort. It has been unsuccessfully explained.

As I see it, this is money that is being paid back to the university for expenses the university has incurred. Somehow that simple truth doesn't seem to get across. The faculty are, indeed, patrons of research. Dr. Brown, I think, just explained to you how he generously contributes the university's money to the support of your research. That's fine, but that's what it is. When a faculty member does not put in the full percentage of his time on a sponsored effort, he in essence makes a donation of the university's salary to the sponsored research effort, because the university pays the salary, presumably, for things that need to be done.

Now, I don't think anyone on the university side objects to that because the university has as much of a stake in the successful research effort as any institution has. I think one of the points raised in the position paper had to do with incentives for keeping costs low, and here I would agree there is such a distance between the individuals who make the decisions about indirect costs and those who, in essence, are generating both the resources and the problem--namely, the schools or the faculty--that the incentive is hard to maintain.

Then, I think one can't deny that the rules by which we are asked to operate contribute to this problem--that A-21, the requirements for institutional review boards, the requirements for affirmative action, the satisfaction of the whole array of Federal programs, all designed for good purposes, add to those numbers of people who then come back again as a percentage of effort which palisades into increases in cost. And that is a problem that is not the university's alone; it is not the NIH's problem alone; but it is a problem, and it is going to--every time a set of regulations comes forward which requires an institution like ours to provide data about this or that in relationship to our total effort, and a substantial percentage of our total effort is going to be in the research sphere--it's going to add to the administrative costs. And this is something that we just can't escape or deny.

DR. FREDRICKSON: Julie, will you stay at the podium just for a moment. There will certainly be questions, discussion. I'd like to begin by asking a question: Do you know how much current time-and-effort accounting adds to your administrative costs? Do you have the contribution that has been calculated?

DR. KREVANS: No, and I have resisted doing it unless I have to, because it will cost to do it. I am not trying to stand up here like the patron saint of efficiency. I am terribly distressed that we spend almost a million dollars a year in our Dean's office. But I am cheered a little bit that the percentage of our total budget that goes to administration in the Dean's office has gone down.

The reason this is true is that I have resisted asking that kind of question, Don. There isn't any way to get information of that kind without doing very expensive studies, and if someone wants to pay us to do it, I'd be glad to, but I can't answer the question.

DR. FREDRICKSON: Jim Kelly.

MR. KELLY: Could you just follow up on that? Are you having faculty perform individual time-and-effort reporting, and could you give us some sense of faculty reactions?

DR. KREVANS: Well, in mixed company it's hard to answer the second question, but I'll try. We have proposed--we, now being the University of California--to the Federal agencies a procedure which we think will be accepted by the faculty, and has been discussed, to deal with A-21, and it does call for faculty time-and-effort reporting. There are some exclusions related to minimum amount of involvement in sponsored Federal activity. We have cut down the number of times it must be done, and I can't remember, but I think it's down to three times a year or twice a year instead of every month. We have excluded faculty who don't have more than a certain participation, unless they are principal investigators; and the faculty groups through the academic center that have looked at the proposal have said they are willing to do it. The enthusiasm is not enormous.

DR. FREDRICKSON: You indicated earlier that the faculty participates, though, in setting indirect costs, at least to the point of providing a certain amount of resistence that retards efforts to change the rate. Is that true? How does the faculty participate in setting indirect costs at the University of California?

DR. KREVANS: Well, it participates through the faculty senate. I guess it's fairly uncommon structurally. The regents of the University of California, as you know, are established by the constitution of the State, and in turn the regents have directly delegated to the faculty the governance authority on all academic matters, and the faculty senate mechanism, per se, is part of the senior structure of the university, and so all important matters that relate to academic activity are reviewed by faculty senate agencies; and when the indirect cost proposal went in with the numbers showing a fairly substantial rise, the faculty senate--the system-wide faculty senate--raised strenuous objections, and on the basis of those objections, the President's office withdrew the proposal.

DR. FREDRICKSON: Excuse me. Howard Temin, did you have a question?

DR. TEMIN: Just to follow up on that, I have two questions: One is--that would mean that from the university's point of view, all money required for indirect cost was not being recovered; it must have come from somewhere else. So one question would be: Where is that other source of money? And after that, I would like you to talk about this difference of threefold that you projected between different institutions in the system, and if something could be built in the system to reward those institutions that were efficient, rather than, as now, in a sense, punishing them.

DR. KREVANS: Let me take that last one first, because it's a very critical one, and we can come back to the others. I am not sure we're more efficient in San Francisco because we have a lower indirect cost, as a matter of fact. We may be more efficient, I hope we are. The reason we have a lower indirect cost, if you calculate it per campus, is we do so much less for our faculty. The stuff that Ken is paying for on his direct costs at Santa Barbara is provided out of the school, out of the campus. In other words, if you go to Santa Barbara and do research, they have a fully paid-for electronics shop. He buys his electronics.

DR. TEMIN: But then, he is subsidizing Santa Barbara. His grant is subsidizing Santa Barbara.

DR. KREVANS: Well, I think that is a way of looking at it. On the other hand, just as Ken feels good, a patron of research, by donating his salary, I feel good as the dean of the medical school supporting liberal education in Santa Barbara. Yes. I think the answer is--

DR. TEMIN: But the system, then, has no incentive--

DR. KREVANS: In the University of California system--

DR. TEMIN: There is no incentive to save money. There are no incentives for anyone to economize because you are going to take the high rate, and you are going to be subsidized by those who are, in a sense, more efficient or using better economy.

DR. KREVANS: Well, if you look, that's not true. The program people have no control over what gets put into indirect costs. What gets put into indirect costs is a negotiated arrangement between the President's office and the Federal Government, and the incentive to save money is to not get into trouble with the auditing process, and I think what is done item-by-item is the way timid people fill out an income tax form: They claim less so they won't be audited. So I think the incentive is built into the system. There's no incentive--

DR. TEMIN: There's no incentive to cut your costs so that you are claiming less.

DR. KREVANS: Yes. That's what basic incentive is, and I think that's what is done.

DR. FREDRICKSON: Dr. Brown?

DR. BROWN: I would like to go back to your question, Dr. Fredrickson, about faculty participation, because, from my point of view, I find it interesting that there has been no mechanism which has actually solicited any faculty participation on the matter of indirect cost at all. The only time it has actually come about is when the situation has become so severe that the university-wide committee on research took up this issue, and it did so in response to faculty requests.

This also bears on something that Julie said about faculty disenchantment. I don't like to think that the faculty is disenchanted. It is certainly dissatisfied, but not for the reason that Julie said, and I really want to clarify this. I don't think the faculty is dissatisifed because of perceiving that there is anything really cloudy about these processes or concern that the money isn't being properly spent. The fact that faculty concern is now becoming a major point is the simple consequence of the mechanism in which the process works, and as you all know, the mechanism is one in which the indirect costs get taken off the top, and what's left in the NIH budget for direct costs is what's left.

Now, since the indirect costs have been rising rapidly in recent years, this means that the money available for direct costs has been suffering from the dual aspects of inflation and the increase of the indirect cost allowance, and this, of course, has decreased the amount of money available for direct research. It has made the support of research more difficult, both for NIH and for the individual investigators, and it's because of this consequence of the way the system works that things have now gotten to the point that the faculty is becoming quite concerned, but it's concerned for a very practical reason.

DR. FREDRICKSON: Dr. Brown, to follow along that statement, do you know how the ratio of direct-to-indirect cost has changed on your grant over its 20 years of life? Have you any idea? You indicated a continuing rapid rise in the cost.

DR. BROWN: Well, as you know, the document we put together at the Eye Institute showed that. There was, overall, for the Eye Institute and for NIH, between the period 1970 to '79, an increase country-wide and Institute-wide from about 29 percent to 41 percent. At our particular institution--I can't give you the figures--but at our institution, it hasn't risen very rapidly. As you will also recall, we showed in that document that certain universities have had very little rise over that period, whereas others have had very spectacular rises. We are one of those that has had a relatively small rise.

DR. FREDRICKSON: Dr. Eisenberg and then Bill Danforth.

DR. EISENBERG: The kind of feeling that the faculty at UCSF has expressed is not new. It's worse because the money is shorter. In all of the years that I have been on faculties, the complaints about the overhead, the indirect costs, when they were lower were just as nasty as they are when they're higher. Part of it, I think, is the terrible indictment of faculty--parochial, narrow, self-concerned. If the money goes to them, the hell with the rest of the university, and I really find that distressing and distasteful.

A good part of it comes from the fact that, although Julie says it's explained, it's explained in the same way that a corporation explains to its stockholders how its monies were expended. There are accounting fictions. Now, fictions aren't the same as lies. Fictions are a way of trying to represent some picture of reality based on a theory of reality, but it can't really be documented. It is the same kind of fiction the telephone company uses when it applies to the public utilities commission for an increase in rates. It values its property as much higher than the public interest groups would value the same property, because that value of the property is the basis for calculating a reasonable profit.

Now, what I can tell you is that countless explanations will not suffice. Faculty really doesn't believe it, and I have tried several times to try to find out where they think the money is going--I think the question that Dr. Temin asked is somehow the key question--that is, what concerns the Government is to be supporting this research in an effective way, not having its purposes diverted, and what I think very few people conceive of apart from the argument about the rates: How does one build in, both to faculty and to administration, incentives for efficient use?

I don't know a faculty member who, if permitted to, wouldn't have two secretaries or five technicians where they now have one or three or whatever. How do you control that? Well, presumably, the peer review group that looks at a piece of research has a sense of what it would take to get it done and therefore decides what a legitimate expenditure would be. But how do you monitor administration? How do you settle the question that people have on both sides of not trusting each other, of making sure this isn't a grossly inflated system? You know, I think somehow or other addressing that becomes very difficult. I don't know how we get some direct contact with those issues.

DR. FREDRICKSON: I wish you would think about it so that at the end of the day you can give us your swan song on that. Julie? And then Bill Danforth.

DR. KREVANS: When you raise questions, you can't leave out some, because if you do, we're going to get into trouble. One of the temptations-- and it's sort of indirectly stated, for example, in the report that came from the UC Academic Senate on Indirect Costs and also from this position paper--that perhaps what we ought to do is put back less than it really costs and, in a sense, test the university. Are they really interested in supporting research?

Now, if you go that direction, you have to ask yourself the question, Is the Federal-sponsored research project best served by allowing it to be uniquely diverted to those universities that have extra cash to throw around?

Because that's what's going to happen.

DR. FREDRICKSON: Bill Danforth?

DR. DANFORTH: I was going to speak to the question of incentives, because I think that's very important, and from the standpoint of a university administrator, the universities at present actually do have very strong incentives to hold down costs in most areas to which the indirect reimbursement goes. If, for example, 20 percent of the heat, light, and power bill is covered by a Federal reimbursement, that means 80 percent is covered by university funds. So the fact that the Federal Government is reimbursing for part of the cost doesn't much dilute the incentive to hold down the overall costs.

You could find exceptions. There are certain offices that might be funded 75-90 percent by the Federal Government, but I think they would be in the minority. Rather, the incentives, it seems to me, have to do with negotiation between the university auditors and the Federal auditors. The university auditors have a strong incentive to charge more to the Federal Government, and the Federal Government auditors have a strong incentive to pay for less; and from my vantage point, the Federal auditors are in a much stronger bargaining position because they really make the final decision.

Now, the only incentive, I think, that that doesn't get at is if the dean or the chancellor wants to have ten extra secretaries or whatever and charge them to the general university budget at the expense of faculty salaries and things that the faculty wants to do. Certainly that's bad, but it's not unique to the Federal overhead payments.

DR. FREDRICKSON: Estelle, did you want to make a comment?

DR. RAMEY: Yes. I think a faculty gets conflicting messages from administration on the matter of external granting. The first message is that every faculty member should try very hard to get as many grants as possible from the Government because this is very important for the economic as well as the scientific status of the institution. That's not entirely explained by the administration, except the implication is that the monies that come in, particularly as overhead, in some way rebound to the economic benefit of the institution, which would suggest that the overhead doesn't only pay for the actual cost, but there is something extra that the university gets out of this, because if, indeed, it paid only for the cost of running the research, then it would be a null point. The university wouldn't be in any particular point of advantage for having the grant. Now, that's one message.

The other message coming through is that with the demands of the Federal Government for accountability, the administration has to put on so much extra staff that the person with the grant is actually putting a burden on administration, which accounts for the rapid growth of the administrator's staff. He needs more secretaries, more computer experts, and the net effect is that the investigator then is made to feel that having that grant is a burden, which accounts for the enormous increase in administrative staff.

So these two messages keep coming in to the faculty member, and the faculty member usually ends up, as has been indicated, in not believing either one entirely, but feeling, on balance, that the administrator's office, with all these additional secretaries, is not really there for his or her benefit so far as the researcher is concerned--that indeed the administrator is getting the advantage from these grants and that indeed the expenses of administration far exceed the needs of administration and that they are therefore riding on the backs of researchers.

Then the final thing in this respect comes down to, if that's the case--if the university is benefiting from my research--then I should indeed be paid a higher salary when I bring in a grant; and the university says the grant is not helping us at all and why should you be paid a higher salary; and so this goes on and on and on. And ultimately, the administration blames the Federal Government, which, of course, is the best place to blame; and that's how I see it from the point of view of both faculty and administration.

DR. FREDRICKSON: Bill Anlyan?

DR. ANLYAN: Well, I have the feeling we are looking at the liver instead of looking at the body with the liver--namely, the financial profile of the academic medical center and where research and indirect cost fit into that. If one looks at the income side of education research and patient care, obviously we have tuition and endowment or State appropriation supposedly for education, the research component, and the patient care.

If our basic policy is going to be that each should try to be on its own bottom and be self-supporting, what is the situation at the present time? In terms of the financial profile of the academic medical center, education doesn't pay for itself. Tuition, I would guess, only covers 10 to 15 percent of the cost of education, especially in the private universities. Endowment has certainly not been growing in the decade of the 70s, and I would think that the State universities are having a hard time in terms of appropriate subsidy from the State. Research has never borne the true costs, as we have looked at it in our institution, and Circular A-21 will certainly make it a lot more difficult, and the shortfall will be even greater in terms of research being self-supporting in this complex mosaic.

Well, where is the money coming from? It's obviously coming from patient care, because two-thirds of the faculty of the academic medical centers are self-supporting to a great extent through the patient-care dollar. At the same time as this trend is going on, faculties want their salaries indexed to the CPI, more fringe benefits, and students want lower tuition. So we have to look at the mosaic of the research, the direct support, the indirect support, and what A-21 is going to do in the context of this total financial profile of the academic medical centers.

DR. FREDRICKSON: Jim Kelly and then Dave.

MR. KELLY: If you could just put that slide up for one second, I'd like to make a point that I think is important to the discussion. I think that we've had a number of people that sort of equate high indirect cost as being an inefficient organization and low indirect cost as being an efficient organization. I'd just like to point out that the 31 percent would be very considerably higher if this institution did what a number of them do, and that is to take the animal and animal care, electronics and optical parts, and the chemical/glassware/photographic supplies, the electronic shop services, machine shop services, the secretarial services and reprints and move them from direct to indirect. It wouldn't make this institution any more or any less efficient, but the indicator would be that it's less efficient because instead of being 31 percent it would be 50 percent, but it would be exactly the same dollars.

So one institution may go to great lengths to get as much directly charged as possible. In this institution, it may very well be possible to take the area of departmental administration and break that down so that you have assigned half of it to the project directly and not show it and get this down to 20 percent for indirect cost. It would not be an indicator of efficiency.

I must say that from my own personal standpoint, I believe that the relationships between institutions and faculty would be much improved if more direct charging were done in order that the principal investigator didn't look at this large indirect cost figure with which he or she is not familiar and feel that it was a diversion of their funds. So I, myself, would argue in favor of greater direct costing, but I think it's important to understand that a high indirect cost rate can conceivably be a measure of efficiency. It is possible that the reason for a high indirect cost rate is that you have amassed in central-service functions more economical provisions for providing services.

A good method of approaching this is, if you have a good secretarial pool arrangement--have a method of calling in and dictating to a central pool, versus having a secretary charged against every one of the projects--that would effect an economy, and cause indirect cost rates to go up.

DR. BROWN: If I may comment, we do both of those, because in this case we're dealing with a secretarial pool, but we're only recharged for our uses.

DR. FREDRICKSON: Dave Kipnis?

DR. KIPNIS: Exactly the same comments relevant to faculty distrust or sense of insecurity in dealing with administration concerning research is voiced when it comes to practice income also. The naivete of most faculties relevant to the true costs of clinical practice are substantial. And one of the issues that bothers me most is that whether it be practice in the form of practice arrangements, which have been proliferating about the country, or whether it be with respect to the directives of accounting, it further increases the divisiveness of the faculty with their own institution and the failure of faculties, I think, for several decades to recognize that they participate as members of a total institution, and that not only the economic, but the intellectual vitality of that institution is dependent upon their total contributions; and it's reinforced when one faces auditors who ask how you spent your time on January 5, 1976, and ask a diener, who hasn't the faintest idea that three grants are supporting a certain activity, how much time he spent on this grant or that, and if you, in essence, say to the auditors that this individual hasn't the faintest idea what grant it was and I'd like to show him the information, they say that you're interfering with the auditing process by prejudicing the response.

That kind of divisiveness is magnified considerably. The other thing is that most of us who are chairmen of departments spend a fair amount of our time attempting to recruit talent. Now, what do you use to recruit talent? Well, basically, what you really use is institutional commitments and the strength and vitality of the intellectual environment. That's an overhead cost to research.

Each of us sitting around here knows molecular biologists at a university who are being paid $50,000 to do research which would cost corporate entities three times that much to do. Why do they elect to live in an academic environment? It's because the institutions are committing funds for that, and that's an indirect cost, which is very difficult to quantitate. It's the indirect cost in terms of supporting our young assistant professors for the first two years before they get started. Where do those monies come from? Clinical practice increasingly so, but then your clinical practitioners who pass fiber optics into any imaginable orifice are complaining about the fact that they're not keeping up with the CPI.

In essence, I really think that the administration of practice funding on the one hand, which is again Federal agency, or its research on the other hand have continued to drive wedges between faculties and their own institutions to the detriment of the whole establishment, and I think that's an issue that this group ought to face up to. How do you quantitate that in indirect costs? I would suspect it's difficult, but yet it's a real factor.

DR. FREDRICKSON: Linda, and then Mr. Kirschenmann.

DR. WILSON: I think soon we should in this meeting make sure we are all working from a common understanding about what indirect costs are, and I don't think we are. A lot of the comments that I have heard so far make me believe that there are some people who believe that indirect costs should be on an incremental basis and others recognize it as a matter of fact the way the ground rules operate now. They are on an average-costing basis.

Many of our faculty do not approach the indirect costs from anything but an incremental cost basis, but as a matter of fact we can't have it on an incremental cost basis because there's no way to get a base line; there is no way to decide what the increment can be, and so we use a very fundamental, well-accepted accounting principle of averaging. As soon as we average, it means that some will get more and some will get less than the true costs.

We are not really ready to accept in universities that the universities cannot provide the total support for research at the level at which our faculty would like to operate. Until our faculty understand that, I don't think we will ever get over this misunderstanding. Until the faculty and the administrators and the people in the agencies recognize that what is a direct cost and what is an indirect cost will differ from institution to institution because of the way they're organized, we will have continual misunderstandings among one another. Until we all look carefully at why indirect cost rates increase, why rates differ, you will continue to have this acrimony.

I think Dr. Ramey put her finger on it very carefully. The way she described the messages that she is hearing from the administrators in her institutions makes me shiver. I know that no self-respecting administrator would have said the things she heard. I don't doubt that she heard them, but I think what we have is a local situation in terms of communication, and an awful lot of it is because when we go to communicate with each other, we don't make a commitment to hear; we only make a commitment to communicate our own point of view. I don't think the indirect cost issue will be settled until we all make the commitment to hear what the other side is saying and it's down to size.

DR. FREDRICKSON: Mr. Kirschenmann--giver of great audit exceptions.

MR. KIRSCHENMANN: I just wanted to make a comment on what Jim Kelly said in the recent slide, and what he says is absolutely true; but there's another aspect of that, and that is to the principles, the cost principles, that we use; and I think everyone's philosophy is that we ought to try to identify costs associated with a given grant to that grant and not to shift those costs to another grant which received no benefit from them.

Now, the extent that you follow the practice that Jim Kelly was suggesting--not suggesting, but identifying up there--you are indeed doing that. You are shifting costs from one grant--costs incurred for the benefit of that grant-- to another grant. Now, to what extent you do this is a question of judgment. There's a line. We can cost all day long. We can come up with the most finite costing system in the world, but there is a judgment factor: at what point do you stop receiving benefits?

The other point I just wanted to make for your consideration is the fact that we talk about incentives and the distrust of faculty of accountants for massaging figures, and indeed that distrust exists even among accountants; but the way you restore that trust, if you will, is to have a complete understanding of what it is, of the process, of the techniques that you are using to determine costs, and to cost out the insufficient specificity of the parameters in which you can do this massaging, and I think that's one of the main questions that this forum is going to have to discuss. At what point do you want to stop costing so that charges or costs which are incurred for one project are not shifted to another, and at what point do you want to stop costing so that you have that credibility--not only within your own institution, but between the institution and the Federal Government.

DR. FREDRICKSON: I think we're going to walk across that stubble field many times today. Dr. Hansen?

DR. HANSEN: I wanted to talk about Mr. Kelly's comment concerning the differences in allocations of indirect costs, where indirect costs may be calculated differently at different universities. I think the problem is far more complex than that. I compared, mentally, my grant to Dr. Brown's grant, and it looks identical at the University of Michigan in terms of what services are in the direct versus indirect, and yet Michigan has well over 50 percent indirect costs, and I think it is that kind of disparity and confusion about how these differences are really achieved that I think needs to be addressed further. Why is it that there is such a huge difference between ostensibly comparable universities with similar accounting methods?

DR. FREDRICKSON: One thing I would urge you all to do in talking about indirect costs is to express indirect cost as a percentage of the total. You may have been doing that. Ken Brown's paper doesn't; it uses another index, equally legitimate. But let's try to talk about indirect cost as a percent of the total cost if we can think about it today. Lou Sullivan?

DR. SULLIVAN: I'd like to raise a question both for Julie and Dr. Brown, related to the comments that you actually allocate less salary costs to your grant than the actual percentage of effort that is placed in; and that really means, as I think Julie suggested, that the taxpayers of California, or whatever other resources you have, are actually supporting that effort--in other words, providing additional support for your grant. I'd like to raise a question about how this has come about. Is this a deliberate policy of this institution to allow for that kind of subsidy, or is this a de facto arrangement, because certainly other institutions that have limited resources for research support or other activities may not really have that kind of capability; and in essence, what you are saying is that your grant doesn't really reflect in the direct cost category the real cost to the university of doing research; and I'd like some comments as to how this process or this policy has developed within the university.

DR. KREVANS: As I say, I can't tell you how it has fully developed. I have been there ten years. Historically, not just the University of California, but many universities like the University of California, have as almost a tenet of faith that it was improper for the faculty salary to come from any place other than the university. This was not just true for state schools; an individual who had an endowed professorship thought it was outrageous if that endowment didn't pay their entire salary.

Now, life has changed, and increasingly in the time I have been there, we have been encouraging-- Is that a fair word, Ken?

DR. BROWN: What are you going to say?

(laughter)

DR. KREVANS: --the faculty to put down on the grants for support of their salary for the percentage of their time for sponsored research, on the theory that that's where their effort is going and that's where their money should be coming from. What we are seeing now is a sort of a--not a mid-position. It is much closer to the full support, but it is a dragging out of the past practice of never putting a nickel down, but it's not a requirement: We don't have a school rule which--

DR. SULLIVAN: So this is determined by the individual faculty member.

DR. KREVANS: Yes, in consultation with the dean's office.

DR. FREDRICKSON: There will be more time for discussion. I think, Ken, you clearly must have a final word. In fact, there will be more discussion time as we go along this morning because I haven't given you as much time as I promised to discuss indirect costs from the scientist's viewpoint.

Let's have a break for just ten minutes for coffee and then return.

(Brief recess.)

DR. FREDRICKSON: Two corrective announcements: The university world likes to express indirect costs in terms of percent of the total direct cost, and our Division of Financial Management likes to express them as the percentage of the total cost. You may do either, but just indicate, please, that it's percent of total direct, if that's what you usually do. The other misstatement was that I said NIH was responsible for 36 percent of the Federal R&D in universities. That's not true. It's of all R&D. (Corrected above.) Our share of Federal R&D to universities is somewhat around 50 percent, which, I guess, just increases the reasons why we ought to be sitting around and talking about the issues that are before us.

There may be some sense of recycling, some deja vu as we go along. Don't be disturbed by that. That is the whole purpose of this particular part of the program. We want to provide a backboard against which everyone can play, and therefore we won't be surprised if some similarities, but also some dissimilarities appear in the next presentation. We will get back with plenty of time to discuss the issues that were residual after Dr. Brown and Dr. Krevens. But let's go on for the moment and ask Frank Abboud from the Department of Medicine at the University of Iowa to tell us of some similar kinds of information and see if things are the same out in that part of the world as they are in California--and this is another public university.

DR. ABBOUD: I want to first thank Don Fredrickson for asking me to appear here to share with you some of my thoughts about direct cost primarily. I have been asked to give you a breakdown of direct costs, particularly of our research program at the Cardiovascular Center, but before doing that, I'd like you to allow me to share with you some of my thoughts as a direct beneficiary of the marriage between the NIH and the universities. My survival and that of thousands of clinical investigators in more than 100 universities depends on the cooperative partnership of the two.

May I have the first slide, please?

(Slide.)

On the one hand, the NIH provides financial support. On the other hand, universities nurture and protect creativity and freedom of thinking. The combination has allowed immense strides in the march of knowledge for the well-being of our society and, indeed, the welfare of the whole world.

Where is the primary responsibility and primary accountability in this union? In our democracy, both government and university are accountable to the public. What are the threats to this heretofore successful operation? Will the Federal Government stop supporting research? I don't think so. Or should I say, I hope and pray no? Despite exasperating inconsistencies in the support for research, I firmly believe that the Federal Government will continue the support of what must be its most successful investment. The alternative is inconceivable to me.

Will the universities become service-oriented trade schools under the pressure of fiscal constraints and lose their creative energies? I don't think so either. Creativity is the essence of universities. Where, then, is the threat? It may very well be in the accusatory, defensive posture of the NIH and universities, leading to the implementation of rigid accounting measures with ever-increasing regulations--yearly, quarterly, monthly, even hourly reports. This will lead to erosion of time, trust, and money.

I wonder if the, I am certain, very well-intentioned auditors know how difficult it is to partition your intellectual effort? How does one divide up the thinking time? Last Sunday I was in church, and the sermon was not the most inspiring one. I am sure many of you have been in the same situation. My mind drifted away, and I started thinking about experiments. Now, how should I report that effort? I wasn't in the lab; I wasn't in my office; I wasn't at my desk at home. In fact, I was doing two things at once. The truth is, I very often do two things at once. I think of experiments in some of the most intimate moments, and I'll spare you the definition of these moments. It is, of course, very difficult, very difficult, to report that effort. I might end up with 200 percent effort and get the University of Iowa in trouble.

The point I am making is that rigid accountability requires a knowledge of exact costs and exact benefits, and this is very difficult to do. Society and government should be aware of the hidden benefits and hidden sources of support that continue to pay for the research efforts of the clinician/scientist. Next slide, please?

(Slide.)

One hidden cost or benefit for research is the contribution of the patients who come to university hospitals and who knowingly and willingly participate in the research efforts because of their faith, trust, and hope in what the university-paid-for scientists represent.

Secondly is the great subjective, intangible contribution to the research effort of the clinical investigator, which comes through the satisfaction inherent in the pursuit and discovery of new knowledge and is made possible through the creative environment of the university. No auditor can ascribe a numerical value to these crucial elements in the cost/benefit accountability formula.

Now let me shift to the specific distribution of direct cost in our Cardiovascular Center. May I have the next slide, please?

(Slide.)

The Iowa Cardiovascular Center has an annual budget of about $5 million. This comprises 14 different sources of funding. The first seven are shown here on this slide. They are represented by a contract, a specialized center for research in arteriosclerosis, an interdisciplinary program project grant investigator-initiated, individual research grants investigator initiated, an institutional training grant for the immediate postdoctoral period, research career development awards for the more established investigators, and individual NIH fellowships. The next slide, please?

(Slide.)

The next seven areas of support are the University of Iowa direct support--and I will describe that a little more in detail later--American Heart Association, Iowa Heart Association, Veterans Administration support, other fellowship support, NASA grants, drug companies, and the portion of the clinical research center that is ascribed to cardiovascular research.

I'd like to show you now a breakdown of the direct costs on three types of NIH grants, which I have selected because they allow me to make two points: one, the university's contribution to direct costs and, two, the different indirect cost formulations that apply to such grants. Next slide, please?

(Slide.)

DR. FREDRICKSON: Frank, could you tell us how many separate instruments, contracts or grants, are involved in supporting your center? Is it more than 20?

DR. ABBOUD: The orange part shows the NIH-supported contracts, program project grants, individual grants, career development awards, training grants, individual fellowship. This mustard-colored section is what we estimate to be the university's direct support for the program. And this section is the support from other institutions, voluntary health organizations, NASA, VA, et cetera.

Okay, I said I am going to describe in more detail direct support on three types of grants because of the variance in the indirect support contribution that each one of these provides. The next slide shows the program--

(Slide.)

--the program project grant, these are the six categories: personnel, consultant, equipment, supplies, travel, and other. In the personnel we have faculty, technical staff, and secretary. The point I want to make here again, as was made in the case of the investigatory format of the faculty, is that support on the program project is only a fraction of the total amount of effort provided to that program project. The intramural consultation is not shown in here. Nor is the part of the supplies that is the university-contributed portion.

(Slide.)

The next slide shows what I mean by partial support of the faculty's effort on that program project grant. There are 33 investigators listed on the grant, each contributing on the average 20 percent of their effort to give you 6.4 full-time equivalents. The salary of the 6.4 FTE plus fringe benefits would amount to $365,000. The actual cost to the program project grant is $134,882, or 37 percent of the total effort provided on that program project. So 63 percent comes from a different source--from the university. Next slide?

(Slide.)

Now, this is another source of support, the institutional training grant on the left, and an individual NIH fellowship support on the right. The institutional training grant provides for 13 fellows. An individual fellowship is shown here. The salary of the individual fellow is certainly higher than this, and the university would make a contribution to bring that salary up to the competitive level at that institution.

Now, the indirect cost of institutional training grants and individual fellowships is fixed at 8 percent of the total, whereas, in the program project grant, the indirect cost was, until the 1st of July--this coming 1st of July--it is increasing to 61 percent of personnel.

DR. FREDRICKSON: How much?

DR. ABBOUD: 61 percent of personnel, beginning the 1st of July. John Eckstein will tell you a little more about what it is going to be. So in the institutional training grant and individual fellowship, the indirect cost is only 8 percent of the total.

(Slide.)

The next slide shows you another situation of an individual NIH grant, but this individual NIH grant is to an investigator who happens to have a research career development award. There is a ceiling on research career development awards of $30,000. $35,700 represents the additional fringe benefits. Now, the salary of that individual will be much higher than this, particularly the portion of the effort provided to that grant. It may be 75 percent of the effort, so that there is a contribution going to his salary of about 25 percent of the salary that could't be ascribed to the grant. He is not allowed to put his salary on his individual grant as long as he has a research career development award, and the research career development award ceiling is fixed. The indirect cost on a research career development award is 8 percent, but the indirect cost on the grant is 61 percent of personnel, so that by competing for a career development award, there is loss, in a sense both in indirect costs to the institution and also loss in the fact that the individual cannot put his entire effort or any of his effort on the grant. Next slide?

(Slide.)

That is all I want to say about the direct costs and their relationship to the indirect costs, and now I want to summarize and end my talk by emphasizing two points: The importance of the partnership between the university and government depends primarily on the fact that we have common goals: to preserve and foster creativity of the young investigator. That relationship will be only maintained if there is a quantum of trust, because--and now the second point: perfect accountability is a delusion. There are many hidden costs which are very significant, and overregulations are going to be costly, frustrating, and disturbing.

Thank you.

DR. FREDRICKSON: Thank you. Now Jack Eckstein.

DR. ECKSTEIN: First, I would like to thank the Director for arranging this meeting and having so many different participants. I think this is a wonderful way to get started on this business of restoring the quality of the partnership.

I would like to begin, and I will be somewhat repetitive, the indirect costs of research -- Are you aware of feedback?

DR. FREDRICKSON: Is that an economic question?

(Laughter)

DR. ECKSTEIN: The indirect costs of research are real costs incurred by an institution when it accepts a research grant. I wonder if I could have the first slide?

(Slide.)

Now, this is an ordinary budget page of an ordinary NIH grant, and you will notice that the direct costs are itemized in detail under the printed headings of personnel, consultation costs, equipment, supplies, travel, patient costs, alterations and renovations, other expenses, and so on. This is not one of Dr. Abboud's grants. You might take note of the fact that the principal investigator is contributing 25 percent of his time, asking for no money, and the coinvestigator, I believe, 5 percent with no request for funds. You will notice that we charge fringe benefits directly.

There are other allowable costs for the research for which there are no printed headings--and you saw these in Dr. Brown's slide--and these costs include the use of building and equipment, operation and maintenance of physical facilities for the research, general administration, research administration, departmental administration, certain student costs, and library costs. Now, these costs are real and allowable under the provisions of A-21, and they could be even listed as direct costs, but to do so would be very costly and impractical. Instead, they are calculated for the entire university under rigidly prescribed cost-accounting rules that flow from A-21. The result of this process is the institutional indirect cost rate expressed as a percent of total direct cost listed on the grant or as a percent of the listed salaries and wages, as is the case now. I believe July 1 we go to a system of percentage of total direct cost.

Let me say again that these indirect costs are real. They vary from institution to institution, depending on such things as management practices, the age of buildings, local utility and labor costs, and it doesn't seem to me that they can be standardized to a single rate. They must be recovered if the universities are to retain their ability to fulfill their educational missions.

Although I suggest that they cannot be standardized, I was intrigued by the phrase in quotation marks in the National Commission report which said something about a standard deduction. I would like to hear how that develops, but it is an interesting concept.

Now, explaining indirect costs to faculty members and to our scientific colleagues in Federal agencies is difficult. People have to have some appreciation of cost accounting, and they also have to understand something about university financing, particularly the university in which they are working and the universities with which they interact, and they also must have some appreciation of the multiple missions of the university.

Now, I too am going to pass on to you that which has been explained to me by auditors and accountants. We use descriptions somewhat like that which you will now hear in our attempts to teach faculty members about indirect costs. May I have that next slide, please?

(Slide.)

This is a simple diagram to show how the indirect costs are calculated. The first step is to find the so-called base. The base is made up of salaries or total direct costs of all grants, not just NIH grants; and included in that base are contributed costs, such as the 25 percent of the salary that you saw that was not listed. If that faculty member had a salary of $40,000, $10,000 of it would be included as a contributed cost in the base.

The second step is to determine the indirect cost pool which supports the research activities. The rate, then, is derived by adding up all of these charges and dividing it into the total pool, and the result is the indirect cost rate.

Let me attempt to show you how these research pools are derived by talking about the indirect costs in Dr. Abboud's program. I can't be very specific because, as he told you, he has many, many research programs and projects in his large center operation, but I think the comments that I make can be generalized pretty much for the university.

What are Dr. Abboud's support costs and how are they derived and how do they affect the research? First, there is utilization of space. OMB allows, I believe, a charge of two percent of the portion of the original cost of the building for that fraction of the space in the building occupied by the faculty and support staff working on Dr. Abboud's program. The amount of space being used for this program and other sponsored research of the faculty in the Department of Internal Medicine is determined each year by the department head. It would be solely determined by each department. In this case, Dr. Abboud is the head. That information is then sent to the university business office after verification in the Dean's office, and the information is used in the derivation of the next year's indirect cost rate.

We are also allowed to charge for the use of research equipment purchased with university funds. The amount allowed annually is 6-2/3 percent of the original acquisition cost. The theory is that this allowance will permit replacement of university-purchased equipment. Inflation and technological obsolescence, of course, make this formula somewhat unrealistic.

Now, there are other obvious operations in maintenance expenses, such as fuel, heat, light, custodial and janitorial services, and routine maintenance and repair. Once again, these are allocated between teaching and sponsored research by carefully monitored surveys conducted by the engineering and physical plant of the university, and they are based on the space occupied, in Dr. Abboud's case, by his program.

Next, the general administration costs. These are costs associated with all the personnel, accounting, purchasing, and payroll transactions generated by the grant. They are derived as a ratio of total direct cost to the three functions of the University. The Department of Internal Medicine, which Dr. Abboud represents in our institution, has grown in external funding from about $1.3 million in grants accepted in 1970 to something like $6 or $7 million now--something over 400 percent; and that growth rate means the 400 percent increase in such matters as people to be hired, accounts to monitor, equipment purchased, as well as travel and the supply requisitions to process. This growth in Dr. Abboud's department is reflected also in its own grants as well as others in other parts of the university, and has meant that the university has had to acquire more central staff in the purchasing, personnel, and accounting offices. They, in turn, need more space, more desks, more typewriters, more files. They burn the lights a little later at night. And these central business costs that are allocated to sponsored research, rather than the instruction function of the university, are computed as a ratio of total direct cost for sponsored research to total university expenditures.

Research administration costs are mainly those of a central university office of sponsored programs that works with the investigators on processing proposals, budgeting administrative problems that are unique to research. There are departmental administration costs that were identified by Dr. Brown and Dr. Krevans. Our university, in many respects, is highly decentralized so that a large part of administration is accomplished at the departmental level. This includes the costs of administrative activities related to research; costs of the activities of the Dean, the Chairman, the faculty; as well as the time of the administrative and support staff--secretaries, stock room personnel, and animal caretakers--whose salaries are not charged directly to grants.

Departmental administration costs are determined by time-and-effort reports sent to each faculty member, the department head, and support-staff supervisor who must allocate staff time between instruction and departmental research, sponsored research, and departmental administration. On the basis of these data, a ratio is applied to allocate departmental administrative costs to instruction and departmental research and also to sponsored research.

I might say that in Dr. Abboud's department, there are approximately 400 individuals who are in some way involved in the function of this university department. They all fill out time-and-effort reports, and if it is true that the so-called nonexempt personnel will eventually be filling out monthly reports, you can see that the administrative problem of handling several thousand time-and-effort reports will really be significant.

Now, I have identified the student services and the library elements of the indirect cost pool, and these are really insignificant. It is somewhat insignificant related to the total because they--But they relate to the population of individuals involved, the research assistants, and those involved in research who use the library.

The indirect cost grade is calculated by adding amounts determined under these seven pools and dividing that research pool total by, in this case, by salaries and wages; and included in those salaries and wages are the contributed costs, or perhaps they might be identified as shared costs, as I indicated in the previous slide, where the individual contributed 25 percent of his time. By putting that in the denominator of the fraction, the indirect cost rate is reduced. Investigators frequently like to indicate when they submit their grant applications to the Federal agencies that, although they were only asking that the grant pay for 10 percent of their time, they really are spending 25 to 50 percent of their time on the research. That has an effect on the indirect cost rate because it is treated as if it were a direct--as if it were part of the denominator of that fraction.

Well, I could go on and tell you a number of things about how the university handles its indirect costs. Perhaps I might just say, simply, that our university divides our money up into about three different kinds, under three different identification headings. We have our general education fund, which consists of the appropriation, indirect cost recovery,and tuition. We have something called restricted funds; these would be monies given to us for a specific purpose, such as direct money to carry out research, and then we have agency funds in which we really are serving as the agents for some kind of enterprise that perhaps takes place on our campus but is not directly and intimately involved with the university.

Now, the general fund of the University of Iowa, then, contains the indirect cost, and that general education fund is budgeted so that, unlike some universities, those indirect costs don't go back to the departments to be distributed; they're budgeted for the entire university. That gives Dr. Abboud a reason to complain if our purchasing office isn't functioning properly, or if our personnel office isn't functioning properly, but he doesn't have to go out and carry out those functions himself. The university provides those functions. So if the university--if we don't cover our true and legitimate indirect cost, then we have to find the money someplace else; and we would find it either from--in the case of our institution--we would pass it on in the form of tuition, or we would have to get the State to appropriate more money so that we could meet our budget. In one way or another, we provide those indirect services that our scientists need to conduct their research, but it may be through sources other than indirect cost recovery.

There is no profit in indirect costs. That should be very clear to everyone. In fact, if we are paying interest on a piece of equipment on a lease/purchase arrangement of some sort, we can't recover that in indirect costs. There are a number of things of this sort that are technical, but I just simply want to bring them up because they are important in the overall scheme of things.

Well, I think I have far too much to say--that I might say. The cost, the indirect costs of research are going up very rapidly; there is no question about that. And many of those indirect costs are related to governmental regulations that are not directly related to research but impinge upon research. The dollars that are spent--and I don't mean to say that they are improper or anything like that--but to meet OSHA standards, Environmental Protection standards, Affirmative Action requirements--all of these things are costing universities more and more money, and university financing is becoming more and more difficult so that the thing we are talking about today--indirect costs related purely to research grants--has a much bigger impact on the university than we would think about with just that simple proposition--indirect cost of research.

It has an impact on everything we do, and I will say again that in order to really understand what the universities are up against, the people who deal with them and our own faculties must understand how they are financed and what their multiple missions are.

Thank you.

DR. FREDRICKSON: Thank you, Jack. Why don't you stay there just a moment. Perhaps there are questions that people may have about the Iowa system. I would like to start off with one: Do I gather that at the University of Iowa you feel that there are costs of research that are not reimbursed by indirect costs?

DR. ECKSTEIN: Oh, yes. One example would be university-purchased equipment. You know, there is no way that we could, with 6-2/3 percent--if that is the true figure, and I might be in error--but 6-2/3 percent of the original cost per year would not permit us to build up any kind of a fund so that we could, for example, buy state-of-the art equipment in large amounts.

Our business officer told me the other day that according to their calculations, we were recovering approximately 75 percent of indirect costs. Now, I don't know if he meant allowable indirect costs or the totality of the indirect costs.

DR. FREDRICKSON: Do you think anybody really knows, Jack? Is it possible to calculate at all?

DR. ECKSTEIN: Well, auditors seem to find ways to make these things seem very precise.

DR. FREDRICKSON: Jim Kelly?

MR. KELLY: Do you have a teaching hospital?

DR. ECKSTEIN: Yes.

MR. KELLY: Do you charge any of the costs that are incurred for research in the hospital to research, or are they predominantly charged against the patient expenses?

DR. ECKSTEIN: As far as I know, we have no charges against research, but I could be wrong about that.

MR. KELLY: It is a significant element in the medical school that a very substantial amount of research, and an increasing amount of research, is occurring in hospital settings; and there is an increasing awareness on the part of the Federal establishments and the non-Federal establishments, Blue Cross/Blue Shield, that reimburse for these hospitals, that they are incurring a cost which they believe may inappropriately be charged for patients; and I think this may be a future problem.

DR. ECKSTEIN: I think the cost accounting that takes place in our hospital may be able to answer that question for you. I don't have that information.

DR. FREDRICKSON: Barbara Hansen?

DR. HANSEN: To what degree do you see the inflationary increases entered as an indirect cost as disproportionate to the direct cost increases? For example, with OSHA, there certainly is a cost to the investigator who has to fill out the forms and get the physical. I am asking you, is there a disproportion, or are we really dealing with the total research cost increase?

DR. ECKSTEIN: Well, I think we are dealing with a total increase in the cost. It disturbs me that costs are going up, but it doesn't surprise me that indirect costs are going up so rapidly because of the multiplicity of things that we have to respond to.

I was in this same room about two years ago. I was triggered to comment on the Heart Institute fact book. Bob Levy will recall, I think. There was this diagram that simply showed the rate at which indirect costs were going up and the rate at which direct costs were going up and no explanation. I took a little bit of--I guess you might say I took offense at that. I thought there should have been two or three sentences of explanation. It doesn't surprise me that indirect costs are going up quite rapidly.

DR. FREDRICKSON: Stuart?

DR. BONDURANT: Yes. I wanted to make the specific contribution of some numbers, for what they may be worth, and then a general sort of observation. The specific contribution is, to answer your question about unrecovered indirect costs, for the University of North Carolina at Chapel Hill, a study has been done of unrecovered indirect costs, applying the kinds of arbitrary things that Jack mentioned, as to what constitutes the legitimate cost, but not including the very important things that Dave Kipnis mentioned earlier as legitimate charges against indirect cost if one ever really did a thorough charge, and that is, for example, the creation of the environment in which the investigators work.

But I have here the data for the last three years, according to this particular accounting procedure which shows, and this is not just for the medical school--this is for the entire University of North Carolina at Chapel Hill for 1978-79, for example, with total awards amounting to $63 million. The indirect costs incurred were $15 million, and the indirect costs recovered, or the receipts, were $9.3 million, so that they identified $5.7 million, or 38 percent of the total indirect costs, which were not recovered. I think that is in the ballpark of the 75 percent number that Jack gave. If it should ever be of any interest, someone could track down how these numbers were generated--but I must say, in each category it would be arguable, and I would be prepared to elaborate on Dave Kipnis's list by putting in a lot of other things that I think were not included in that category.

If I may, then, just add a general observation. As the morning has gone on, I have found it sort of interesting to step back a little distance from the problem, and I wonder if perhaps others around the table-- Let me just make the observation and then see if it will stimulate some further discussion for the future.

We are looking at a tree, and we are surrounded by the forest. It was not inevitable that the forms of research support that are used in this country today have come into being, and there are other means in which the public welfare can be served by channelling dollars into the research enterprise, and it may even be well to back away for some distance and see the problem that we are addressing today in those broader contexts. For example, on the one extreme, the Federal Government could contract with individual investigators who could literally "have grant, will travel," and negotiate independently for the lowest indirect cost place that will house them; and those with oceanside vistas and other things that might raise their indirect cost rates, and those who live in unattractive places, might lower them in order to compete for the investigators.

At the other end of that spectrum, the Government might opt to simply endow universities and step back and let the universities divide up the money among the investigators. With a little bit of imagination, you can fill in between these two ends of the spectrum a whole array of different kinds of processes for doing this.

Now, this doesn't lead me to any specific suggestion, but as you said at the outset, the purpose here is not to develop specific suggestions. It does put the issues, I think, in a little different kind of a context.

The final thing I would like to observe is that it does seem to me that a part of the misunderstanding that we have heard this morning between faculty and institutions derives from the fact that the system, as it has derived over time, has included in it certain ambiguities as to the authorities and the responsibilities and even the interests of the various actors on the scene--and by the various actors, I mean specifically the investigators, the institutions, and the Federal Government, or the public interest. There are, it seems to me, legitimate ambiguities that have been reflected in comments around the table this morning. Sometimes ambiguities are useful, and I'm not sure that this isn't one of those times; but I think that we should at least be aware as we attempt to address the problem that part of the reasons that we are not hearing--in Dr. Wilson's terminology, that we should hear each other and not just listen--is because of those genuine ambiguities as to the definition of the responsibilities and the authorities of the institutions in relation to the investigators in relation to the donor of the source of the money.

DR. FREDRICKSON: I think that is very helpful. You know, the greatest ambiguity of all is the thought that you can have a university without research, and that is in the minds of all of us, but it doesn't exist--a university--by that definition.

We'll go around. I'll get to you, Estelle, in just one minute. Kenneth Brown, you had your hand up first.

DR. BROWN: Yes. I wanted to ask Dr. Eckstein, Do you feel that, thus far, in your indirect cost recoveries, do you feel that they have thus far kept up with the effects of inflation?

DR. ECKSTEIN: Well, they are negotiated annually, of course. The negotiation taking place in the current academic year was based on data from the previous academic year, and the costs are recovered in the next academic year. So there is a period of two years of inflation involved there, and I would guess, just from that alone, my presumption would be that they were not keeping up with the cost of inflation.

DR. BROWN: But as far as you know, it is only because of that relatively short lag period that it's not keeping up.

DR. ECKSTEIN: No, I wouldn't say only that. I just simply don't know enough about the technicalities to tell you. I do have a figure that was provided to me by our Office of Sponsored Programs that may be of some interest. During the period 1970 to 1979, the University of Iowa's actual--I presume our own auditing--our actual indirect costs were $50 million, but we were reimbursed $40 million. That meant over $10 million was shifted from educational programs to cover these other costs.

DR. FREDRICKSON: Is this for research?

DR. ECKSTEIN: Yes, for research.

DR. BROWN: How much did your percent of indirect cost allowance go up over that period?

DR. ECKSTEIN: I can't tell you. I believe it's 61 percent now of salaries and wages, and I would guess that we were in the high 40s ten years ago--maybe 50 percent. I can't tell--

DR. FREDRICKSON: This is 61 percent of salaries and wages, though.

DR. ECKSTEIN: Salaries and wages, yes.

DR. FREDRICKSON: Not to add to any confusion.

DR. ECKSTEIN: I think, if I'm not mistaken, that we'll be at about 35 percent of total direct costs next year.

DR. FREDRICKSON: Estelle?

MR. KELLY: Using the personal services on the original chart, I have computed it at 39 percent.

DR. RAMEY: One of the things that hasn't come up which is in line with Dr. Abboud's two slides and Don's comment about the point of a university and research is that the research grants in this country have been used to train the next generation of researchers, and that is, to my mind, one of the more important aspects of research support, because in any institution I have been associated with, it would have been impossible to support the cost of training Ph.D.s in the basic sciences without the funding from the outside, and the cost of training students is hidden in the research grants in many ways, but perhaps because it is necessary to hide it because of the rules and regulations; but it is, to my mind, a most important facet of the responsibility of a university, aside from the output of the research itself, to train the next generation of scholars and creative people, and that cost is a teaching--it's instructional, but it's instructional in a very special way; and when you set down how much time you put in your. teaching, most of us who have graduate students and post-docs are hard put to know how much time in teaching is spent in talking to our graduate students. What is usually very obvious is the number of hours we lecture, which is trivial as compared to the number of hours put in teaching students, and I don't know how one cost-accounts for that, but the university in that sense is paying for a tremendous amount of instruction which it does not ordinarily consider instructional cost.

DR. FREDRICKSON: Frank Abboud, and I think then Jack.

DR. ABBOUD: Yes. I had a comment, really a question about how much indirect cost isn't retrieved by the university, and I tried in that pie to show a contribution of the university that explains the percent effort that investigators, in fact, devote to the grant that is not paid by the grant. So one could view this as a major component of costs to the university not shown in the indirect costs as such for these categories. That, we can get a very solid handle on.

With respect to patient care, in our program project grant, we carry out studies on patients, and on the slide where I showed patient input there, this is patient input that's free. I am talking now of the volunteer, the patient who permits certain experimental studies to be carried out. Now, when a procedure is carried out purely for experimental purposes, the patient isn't charged for that. Then our university hospital has allowed us to do that. Now, I am sure Dr. Kipnis will talk a little more about the clinical research center type operation, where the accountability for procedures carried out on patients may be clearer.

DR. FREDRICKSON: Frank, you must forgive one moment of amusement when I asked you how many grants you had in your department and you couldn't answer, and I understand. To contrast that situation with Henry Kirschenmann's feeling that you've got to be sure you allocate costs precisely to each of those grants, I just want to point out that you gave us an illustration of the difficulties of that dilemma. We'll come back to that. Linda Wilson?

DR. WILSON: When you spoke of the ambiguity, and perhaps it is a valuable ambiguity, I couldn't help but smile because in the Commission's first report on accountability, in its forthcoming report on funding mechanisms, we've been struck by the fact that we have a very good grant system for choosing what research to support, but that, as a matter of fact, it is counterproductive for managing the grants once they are in place--administering them, or even being accountable for the funds. The two work in opposition to each other.

Furthermore, the general purpose for which the support is obtained is not something on which there is now any more real agreement between Congress, NIH, the university administrators, and the faculty members who are actually operating the grants. Some of Dr. Ramey's comments about how critical it is to be supporting young investigators, Dr. Abboud's slide which put up that the common goal of the research programs was to train young investigators--that is not what Congress thinks it is providing the support for.

I don't know whether it's wise to try to sharpen up the focus. I'm not sure but what we might lose the value of all research support and do the country a tremendous amount of damage. If we do sharpen that up, we should thoroughly understand among this group here that that is one of the fundamental problems.

I would also like to make, on a much more crass plane, some comments about why indirect costs seem to be going up more rapidly than direct costs. The composition of the indirect cost pools include kinds of costs in which inflation has been increasing at a more rapid rate than in direct costs. For one thing, in universities, direct costs are predominantly direct research salaries. That is, much more of our money in the universities and in the funded research projects is going for salaries than for any other kind of cost. In universities, salaries have come nowhere up to the cost price index--not the professional salaries, not the technician salaries, not the secretarial salaries. On the other hand, we are required by law to keep up with the prevailing wage rates of the kinds of people who are in the indirect cost pools: the foremen, the operations and maintenance people, the electricians, the carpenters. Furthermore, the utilities have increased at an enormous rate. So when you look at the rise in indirect cost rates, you not only have to look at the rise because of the additional regulations, you have to look at the rise in the kinds of costs that fall in those pools. It's an exceedingly complex matter, and I think that is my fundamental point--that any simple solution or any simple statement of the problem is, a priori, wrong.

DR. FREDRICKSON: Jack Eckstein?

DR. ECKSTEIN: I had a comment I wanted to make, but I hate to say anything because what was just said is very important, and I don't want to dilute the impact of that statement; but I would like to say there is another complicating issue in the subject of indirect costs, and that is, we call it the principle of multiple beneficiaries of our efforts in the university. For example, the internist making rounds on the wards or taking care of patients is doing--the attending physician--is doing several things:

teaching students, taking care of the patient, and also may even be collecting data for some investigative purpose; and we've struggled with that in time-effort reporting for other purposes. We had to give it up because we discovered if we had more than one kind of time-effort reporting, you get one set for a board of regents that talks about multiple beneficiaries and another set for the Federal Government. We really have got problems.

DR. FREDRICKSON: Your counterpart from the hospital wants to respond to that. Yes, Julie?

DR. KREVANS: I would like to restate what Professor Ramey said, but in a slightly different way. Not only doesn't it trouble me that we are educating young people in research careers, and I won't say under the guise, but I will say in the midst of exciting research, I think that's one of the real powers of the way we have approached this problem. If you turn this thing around the other way, I think you can make a case that we are stealing from the educational funds that we get for research training and secretly doing research with them, because some of the very best research being done in our institutions is being done by people on training grants, both in the doctoral and postdoctoral level, and I never felt it was a disgrace that we are taking these training grant funds and actually doing research with them.

So the whole point of this is that it works because of this mixed function, and while that makes it difficult for accounting, I am reminded that just this week we gave an award to a colleague of ours named Dr. Stead who would say--among his famous quotations--to house officers who were complaining bitterly, "I know life is hard, but what's wrong with the patient?"

DR. FREDRICKSON: Leon?

DR. EISENBERG: I think the difficulty with the ambiguity is that in the presence of scarcity, we are turning on each other. This meeting has made it even more evident than it was before that there is such a division between faculty and administration at universities, that if I were working for the Office of Management and Budget, all I would have to do is cut costs from the outside. Those on the inside would take care of each other.

The fact that, as a way to make the enterprise go, the medical student, student education is supported out of patient care funds and research funds is not a moral problem, but it becomes a very difficult realistic problem when we are being challenged on both sides about the use of those funds. You can take the Nixon approach, which is that since doctors make lots of money, and they do, they ought to pay for their own education, and follow the course of a number of private universities, which is rapidly growing. Now, if that's your notion of social justice, that's fine; it doesn't happen to be mine. But we, within the universities, I think, are making that a more likely outcome because of the kinds of fighting about allocation of cost.

This difficulty didn't arise when there was enough money to smear around for everybody. One could have always used more, but there was plenty to go on. Now that it's short, we have fighting within the university. Now, I think there are occasions in which we could join together and fight the kind of social decisions which lead to the total limit on research and health costs because it is thought more valuable to build tunnels for missiles. That is an argument we needn't have here. But when we fight with ourselves about this, when nobody can propose an alternative-- I mean, for example, there is often the implication of faculty that because the university wants to recover research costs, the president--or dean or whoever--doesn't believe in research. Well, I don't think that's true at all.

The issue is, How do we run it efficiently?--not, How do we fight over who gets what from whom?

DR. FREDRICKSON: Howard?

DR. TEMIN: As a faculty member who has little administrative responsibility except my own grant, I have learned a great deal from this discussion, because I had never realized how indirect costs were calculated or the exact differences between incremental funding and cost-average funding, and I think that is probably true of the majority of faculty who are primarily concerned with their research, and it's true that probably unrealistically we've felt that the administration is going to profit.

Part of the additional problem is that the kind of things, the questionnaires we get--up until this discussion, I hadn't realized that they're in another language and deal with a different kind of reality than that which we deal with. We deal with numbers. That is our whole being, to generate numbers, and we put a high degree of rigor in the numbers that we generate, and all kinds of tests of reproducibility and reality. So when we get a form requiring us to put down numbers, we tend to think that those are the same kind of numbers, and now I realize that they are not at all that; they have nothing to do with this same kind of reality, but have to do with, as Dr. Eisenberg said, the created fictions, the language that auditors use when they talk to each other; and I would be very interested in hearing what they think their numbers mean. They don't mean the same thing that our numbers mean, and it would be a lot of help to us to realize this. Then we wouldn't have-- Every time I get a form, I cross out things and put disclaimers because I don't like to sign things that don't represent my notion of reality. But I am sure this just goes in a file. It's a signed form, and my colleagues and I could save a lot of worry if we accepted this, and this is in a sense the two kinds of books that I understand corporations do keep for the Federal Government, and we should do the same thing, because it seems that the auditors can't accept the fact that we do a lot of different things at once, and so we can't break it up, but maybe we should just do this arbitrarily and not be at all bothered, because it's a reflection of a kind of reality. All of the efforts are to the common goal.

The other point that I wanted to make as a faculty member in response to this is that we do sympathize a lot with the administration of our own institution. We accept and see that at our institution we've been cited by the Wisconsin OSHA, and we've been fined by the Nuclear Regulatory Commission, and so forth. And so, in response to these things, we've seen an enormous increase in the bureaucracy to handle this; and we have locked cages for radiation so a whimsical thief can't steal one microcurie of tritium and so forth, and these, then, all go into the indirect costs, which go up, and we understand that our administration is not responsible for that and that NIH is not responsible for a lot of this.

So my question to the head of the table would be, what efforts NIH makes in terms of all of these regulations to have exemptions for laboratories in small quantities, chemicals and isotopes particularly, so that we won't, as often, find ourselves in with industry; and this is a ballooning of indirect costs where faculty and administration share our position to the outside--where we feel that this is something very unrealistic in terms of any benefits to health and safety.

DR. FREDRICKSON: A fair question, Howard, but this isn't the time to answer it. I think that, if I may, I will say that the morning has been a success, if measured only in the greeting of Howard Temin, but there has been a great deal more. I would like us to keep on time, and I would suggest that we adjourn now for lunch and promptly reassemble at 1:30. Thank you.

(Whereupon the meeting was recessed for lunch at 12:06 p.m.)

AFTERNOON -*- SESSION
(1:35 p.m.)

DR. FREDRICKSON: The meeting will please return to order. I have one announcement to make. I want to invite all the participants here in this room to the Office of the Director this evening, where we unwind for about half an hour after these meetings. You are invited to come.

I want to welcome John Lordan from the OMB who has joined the table. I don't think anyone else has come in, but we're expecting a couple of more consultants before the afternoon is out.

Well, let's go again. Let's hear about indirect costs this time. We want to turn now to a private university--as though it made a great deal of difference. I don't know whether it does or not. But we're delighted to have both David Kipnis, the Chairman of the Department of Medicine at Washington University, Barnes Hospital in St. Louis, and also Bill Danforth, the Chancellor of that institution, to lead us through some more figures. David?

DR. KIPNIS: Figures sometimes can be somewhat distorted, and I am reminded, if I may just diverge for a second, about a story I heard recently, having had a daughter married, about two women in their '50s, Martha and Jean, who met on the street and hadn't seen each other for about seven or eight years. Martha's daughter, Louise, had just been married, and Jean asked Martha what kind of young man she married, and Martha thought that her new son-in-law was a gem. Louise was able to sleep late in the morning, and her husband got up and made his own breakfast, bicycled to work so that she could have the car, had a maid twice a week, and actually gave her a fur coat on her first wedding anniversary.

And Martha asked Jean what kind of gal her son Harold married, and Jean said, "A real bum. She doesn't get up in the morning, makes him make his own breakfast, ride a bike to school, forces him to have a maid, and had him buy her a fur coat."

And I think that several of the speakers before me referred to the fact that I don't think that the numbers and the analysis of the numbers resolve what should be a philosophical and political decision. I would suggest to you that a significant number of faculty in the Department of Medicine have become increasingly sophisticated in the issues of indirect cost, in terms that they've used a wide variety of techniques to sustain their research operation.

Don circulated this to the participants prepared by one of your own (before he joined you) in terms of how a laboratory was supported; and when I met in the Chancellor's office in preparation for this, the accountant said, "My God, if that's the model the Government wants, it's a nightmare." On the other hand, the investigators shrugged their shoulders and said, "Boy, he's really very good. He's been scrambling and hustling all of his life."

So I would emphasize the fact that a significant number of my faculty are not disillusioned with the university at all. They're convinced that policy decisions have been made and that technocrats have been put into the field to enforce them with harrassments of all sorts. It's an attitude with which I agree, because I don't think that there will be a resolution of this on the basis of attempting to analyze costs. I think the variations would be very minimal, and it's a fundamental issue, a political issue.

Now, the basic premise that we are operating on is that for the public good, the Government is supporting research and wants research done. As a consequence, those institutions who honestly feel that research constitutes a critical element of the total academic life have to provide the resources in one way or another to attract the faculty, which in turn attracts the next generation of researchers to provide for that public goal, and it's in that context that I would like to just review, as a chairman of a department, and then turn to my esteemed colleague and, incidentally, scientist who is a member of the Young Turks. We are very fortunate at Washington University to have a chancellor who was a Young Turk, too, to follow up with our own institutional attitudes.

Could I have the first slide?

(Slide.)

I have selected for discussion three kinds of grants. The first one is that of a new investigator, a young investigator who has just gotten his first grant. Now, this individual, following extensive training in medicine, was at the NIH for three years, followed by a fellowship with me for a year, two years actually, and was then supported by the Department of Medicine as an assistant professor with a laboratory technician, consumable supplies, and salary until it was felt that he was a totally independent and competitive scientist to apply for a grant. This he did and was approved and funded on his first go-around.

On the left are the direct costs. On the right are indirect costs that Dr. Danforth can refer to in more detail, if questions are asked. They were filled in by our comptroller at our university in accord with current reimbursement scales for indirect costs.

Now, in that initial grant, the investigator applied for 50 percent of his salary. All of our assistant professors who are brought in as primary academicians are told that they can spend a minimum of 75 percent of their time. Their actual teaching time is scaled to about 15 percent effort. Now, you might ask, why don't they put in for the whole amount? And the fact of the matter is that the senior investigators who review these grants with them tell them, "Well, you better watch what the study section is liable to say." When you talk about efficiency, I would say that the study sections introduce a great deal of efficiency because they are going to say, "Well, listen, why should we pay him 75 percent of the salary? But if that's the case, we'll have to take that technician off."

So that, by experience, many investigators are trained to put in not for their total costs but for what may be perceived as, by senior investigators who are fairly experienced in study section review, the psychology that will go along with the assessment in addition to the quality of science.

Now, in addition to not covering for that, in this grant there is absolutely no secretarial write-up. After all, the study sections have begun to say, "Well, what does a young, new investigator need any secretarial assistance for?" And if he puts in for a diener or a dishwasher, they will cut it back to one-third of the time, even though it may be almost a full-time operation.

So corresponding to the grant that this constitutes, the principal investigator asks for 50 percent of his income, asks for 20 percent of a dishwasher and asks for one technician.

Now, when it comes to consumable supplies, the other point I would make is that inflation does hit this grant because it was approved for five years. It is in its third year now, but the direct costs are fixed for five years. The indirect costs tend to be negotiated at whatever interval the institutions negotiate with the parent organization, so that at times updating is more frequent with respect to the indirect costs, which are legitimate, than they are with the fixed costs where the investigator attempted to put in some degree of inflation, but you can't put down 8 or 10 percent or 12 percent increases in salaries. Study sections won't look at that either.

So usually by the third year, consumable supply budgets are inadequate to meet the horrendous increase in the costs of tissue culture, fluids, isotope counting vials, et cetera. So that creates a problem for us.

I also put down alterations and renovations as zero. One of the major issues that I think faces our whole academic research activity is the fact that just as our national industrial base has suffered by a failure to attend to a renovation of its plant and an updating of its equipment, we are sitting now, after 15 years of neglect, on academic institutions that have also not maintained their physical plant and updated their equipment; and one doesn't have to go very far but just outside this room to many of our friends' laboratories in the NIH where, again, the physical facilities and the equipment have been allowed to decay and not maintain modernization; and I find it rather interesting that when one looks at the total NIH budget and then at the allocation for extramural activities to the Division of Research Resources, that research resources constitutes such a small percentage of total effort. Now, that is not to say that it's wrong. It may very well be that the total pie, the total size of the pie is inadequate. We face, I think, in our academic institutions around the country, as well as at the NIH, a serious deterioration of our physical plant with no updating.

Now, the rest of these kinds of expenses are fairly standard. Approximately 33 to 35 percent of total cost would be indirect cost. At our institution it is primarily applied against salaries and wages. I forget, Bill, what it is; I think something like 84 percent of salaries and wages. But in this grant--which is fairly typical, as a matter of fact, of our institutional experience--it's somewhere around 35 percent of total costs.

Could I have the next slide?

(Slide.)

Now, the next slide is a grant in its 19th year, by a senior investigator, one of the major figures in American endocrinology. This is one of two research grants, and he is also principal investigator with a major research center. Again one will see that it's very heavy primarily in salaries and wages and relatively limited in supplies, and, again the total indirect costs for this grant constitute approximately 35 percent of total costs..

Now, it's very interesting to look at this grant--one, incidentally, that opened a whole new field. On this whole grant, there is a total of .95 full-time-equivalents of academic force. I am not including research assistants, research technicians, or secretaries or dishwashers, but I am talking about faculty. And again it was the assessment of this senior investigator--who collectively, through all of his grants, brings in about half of his salary--that in his judgment, sitting on study sections, there is a strong tendency to ask how such an internationally known scientist at this senior level can ask for 50 percent or 30 percent of his salary, even though he is well recognized and nobody is going to question it. So somebody else picks up the cost, and, of course, it's the institution, and it then goes into the denominator to, in essence, dilute out reimbursement according to current regulations for the cost of doing research.

So I would say to you that many investigators have already, in effect, come to conclusions, because of their own experiences, where they are hesitant to ask for what they generally know are the direct costs of this activity. So it's just not only indirect; it's direct elements.

Now, I'd like to point out that these are both R01 grants, which I would agree--and I think most investigators would agree--are, in essence, the backbone of scientific efforts in this country and the ones that should be protected best, both in funding new grants as well as in sustaining established investigations. On the other hand, center grants do play a major role, center grants focused, hopefully, primarily on research, and I would like to point out a clinical research center grant. Next slide.

(Slide.)

Now, we were one of the first three clinical research centers. It is currently in its 20th year. This center supports a total of approximately 32 to 33 beds. It varies depending upon what report we get from the NIH at any given time, but it has been--this is a combined unit. For efficiency purposes, we have combined an 8-bed pediatric unit and a 25-bed adult unit; and since its formation in 1960 initially as an adult unit, its expansion in 1964 to a pediatric facility, and in 1967 to a further extension, this is the unit that has been in existence.

This unit, 20 years ago, was one of the nicest facilities in our medical center. One of these floors is now the worst in the center. The entire medical center has been rebuilt in 20 years. The entire hospital has been rebuilt, and one of these floors has been rebuilt, but there is no way now-- We are asking our own hospital, Barnard Hospital, which is one of the constituent elements in the Washington University Medical Center, to underwrite the estimated costs of bringing up to date a 21-year-old hospital facility which, if inspected, probably wouldn't pass inspection. I would suggest that that's not an uncommon experience among many of us.

Now, this large grant supports 2.4 full-time-equivalents of academic faculty. That's all, just 2.4. It is reimbursed at the university reimbursement scale for faculty at about 84 percent. It supports two administrative people, administrative secretaries. Since it's off campus and in Barnard Hospital, it only gets 36 percent, but that's all the overhead we get. The total overhead collection on this whole grant is less than 9 percent of the total expenditures.

Now, one might ask the question, our occupancy rate is one of the highest in the CRC program--a program, incidentally, which I think is a critical one in terms of clinical research in this country and is well recognized by all of the disease multigroups to which you are unfortunately constantly exposed, but it is a critical program.

Now, what does this program really pay for? Well, assuming an 80 percent occupancy, which we do occupy on a 33-bed unit, the per diem charges against just hospitalization are less than $210 a day, which is less than half of what East or West Coast per diems are; and in our own Midwest, which tends to be cheaper, it is still only about 70 percent of actual standard hospital costs for just standard admissions, not research admissions, which are extremely expensive, and that's a fairly good experience. As a matter of fact, to take the whole CRC program, the average per diem runs around $280 for the total number of beds they support, so that allocations of funds have obviously not kept up with the true costs.

That figure excludes the fact that we have 1,200 out-patient visits a year on our clinical research center, whose average duration of stay in that unit is four hours, in which the nurses are intimately involved in specific research experiences. I would assume Dr. Abboud has the same kind of out-patient/in-patient mix. That is not even incorporated into these figures.

Furthermore, when the Barnes Hospital nursing service audits our nurses on our research unit, they find that the intensity of care demanded is equal to that of a standard medical ward in just patient care, exclusive of research activities. I would suggest that all of those are basically costs, then, that are being undertaken by institutions. In one way or another, we generate a fair amount of money from third-party carriers, who have agreed that for patients who have to be in the hospital, you are responsible to let the research pay for it. Our nurses participate in ongoing training programs by our research people. They utilize our conference rooms, but there is no way of recovering those costs either.

So I would suggest that the issue is not just indirect costs; it is actually even identifying our direct costs. And the fact that funds on the national level have been progressively restricted has already been recognized by the most productive and competitive investigators, who themselves impose a fair degree of restriction on the monies they ask for.

Now, the other problem that is not brought in to any of the indirect costs--and to which I alluded before--is the research environment one creates. It is my understanding that, at the present time, an institution may elect--under the pressures of maintaining its hospital capacity fully, and its clinical services--to initiate a practice plan, so that practically all the money generated by practice goes to pay the high salaries of some unique subspecialists, and that relatively little money goes back either to the dean's office or to the chairman for the development of academic programs--which is, by the way, not an uncommon event and I think an increasing event on the national scene at almost every institution.

If an investigator happens to be sufficiently good to survive in that kind of lonesome academic atmosphere, when they put in for an indirect cost, it is almost all reimbursable, because there is no other denominator other than the research cost of that investigator. If, on the other hand, the academic faculty--including, let's say, ophthalmologists and cardiovascular surgeons--are willing to curtail their salaries so that their departmental chairmen and their division heads can allocate funds for true academic development and for training assistant professors to do research and to equip laboratories and buy new instrumentation, that is put into the baseline base, which dilutes out the reimbursable nature from which our overhead is based. So what incentive is there to, in essence, protect the academic environment in that setting? I think that is a policy decision. One doesn't have to worry about figures.

The last comment that I would make would be to reaffirm the slide that Dr. Abboud put up about accounting being a dilusion. I happen to have been the program director of this for 20 years, but until seven years ago, I was very actively involved as also the principal investigator. That is, I really was right on the floor. And in 1966 or '67, we were subjected to an audit, and at that time, the auditors who came were from the Department of Defense. They were really a very dedicated group of people who spent two or three days, and we were arguing about how to allocate my efforts in terms of research, training, and care, and I suggested that for two days--and the head nurse would document it--that they go with me, starting at 7:00 a.m. in the morning, on rounds with the various research fellows and other people; and we did this for two days, at which time I then said, "How shall I allocate my time between research, teaching, and care?" And they said it was impossible, and I would suggest to you that everybody here in this room knows it is impossible and that it's a sham to enforce it. I am willing to challenge anyone who can tell me, if they go into an institution, that they can legitimately distinguish that in an academic setting.

Now, I think if we accept that, then we recognize that policy decisions have to be made, and we don't get lost in looking at numbers and analyzing whether this or that unique event is really an attribute. I would think that there are legitimate areas of argument, but that they could be resolved very easily if, in essence, the fundamental policies were accepted.

DR. FREDRICKSON: Thank you, David. Bill Danforth speaking as the Chancellor of Washington University, or as the Young Turk. I'm not sure which.

DR. DANFORTH: I asked Bill Anlyan what I should say to be most helpful, and he said to tell it like it is, and I have been trying to decide which created fiction to use. Dave has presented so well, I think, the general viewpoint we have at Washington University that there isn't any way to improve on it. I really don't see the point in going through the indirect costs in more detail, and I thought I would try and give you a very sort of macro view, at least as the way I see some of these problems from the particular perspective I had.

If I might have the first slide, this is sort of a super-macro view.

(Slide.)

Here we are. It shows the type of research and development and where it is performed--industry, university, and Government-- and if one focuses on basic research, one can see that about $4 billion of basic research in 1978, at least according to these data, was done within universities; and that suggests to me, thinking about the way research is funded, that, first, the United States really has to rely on universities as the sites of basic research in our nation or else create something entirely new.

Secondly, the Federal Government is saddled with supporting basic research, and we will have to continue to pay for it, or the research simply will not be performed; and the business support for basic research, which is much talked about these days, is relatively small and, even with major percent increases, will not supplant the universities as a major performer of research, nor, I might add, for the Government as a major financial supporter of basic research.

Third, $6 billion in basic research now performed in universities includes associated costs to pay for fringe benefits, the service of accountants, administrators, purchasing agents, et cetera, as well as costs associated with space utilization, and that these costs to support such a large enterprise are significant.

Finally, over the last 30 years, when this has been building up, universities alone and in cooperation with the Federal Government, have made major capital investments in buildings and equipment that are extremely costly and, as Dave pointed out, are in need of repair.

Now let me focus on Washington University. We have made some major institutional commitments to science and research. It is a very high priority. We want to do research; we want to do it well. We believe that the mechanism for doing it well lies in supporting the investigators, providing what we can in the way of support, and that means both direct and indirect support. That commitment, of necessity, includes providing the proper equipment for scientists, and in today's world this is direct support, since many major pieces of equipment cannot be bought with grants or can be only partially funded through grants, as well as necessary back-up services. We believe we have been successful.

Now, may I have the next slide?

(Slide.)

The slide shows income to Washington University--the total revenue coming in and the Government grants and contracts, including indirect reimbursement, and then the percent that those are of the total revenue of the university; and I think you can draw several conclusions from this simple table: Research is important to us. Income from the Federal Government amounts to one-third to one-quarter of the total income of the university, and I think it is fair to say that this might be taken in a rough manner to reflect the percent of human and physical resources that go into Federally sponsored efforts.

Secondly, Federally funded research as a percent of the operating revenues has fallen steadily. One might immediately ask, particularly if you cared about how Washington University was going to fulfill its responsibilities, what areas of income have grown more rapidly than the total. There have been relative increases in tuition income in the nonmedical parts of the university, rising from 36 to 44 percent of revenues from 1972 to 1979--that is, 36 to 44 percent from tuition in the nonmedical parts of the university.

On the medical campus, the main source of increase has been from patient fees--and the percent one attaches to them varies with whether or not one includes Malencott Institute of Radiology, but including it--which increased from 28 percent of total revenues to the medical school in '73, 39 percent in '79. Counting it a little differently, you would come up with different figures but the same trend.

I would like to mention a couple of other points in the funding of an independent or private university. First, on the nonmedical campus, the problem of inflation has been met by a relative curtailment in faculty, staff, and administrative salaries. That has been true, to a lesser extent, on the medical campus. It has been quite serious on the nonmedical part of the campus. Salaries have not kept pace with either the cost of living or the salaries of other Americans. It is a problem not only for us, but I would submit, is a national problem if we want to have and continue to have the best young people going into this enterprise.

Another point is that gifts and grants from private sources have been sought with vigor to purchase ever more expensive pieces of research equipment and to improve research facilities, provide start-up funds, et cetera; and on the medical campus, clinical practice has been pursued with vigor to help with these areas.

Thus, during this period, it has been necessary to raise funds both for direct and for indirect costs of doing research. The endowments of all private universities have been severely eroded by inflation in the 1970s and the relative decline in the capital market. A recent study of major independent universities revealed that $1 million in endowment in 1970 has declined below $600,000 in purchasing power by 1980.

Now, let me just say a word about indirect costs, or more than a word, perhaps. The costs of maintaining the size research operation we have here, whether it be in a university or research institute, industry, or anywhere else, are significant. Although these data show large amounts of Federal support, a substantial amount of the university's own money is committed to maintaining the basic research done for the Government.

Now, we have some calculations for our 1977 fiscal year, and those are shown on the next table.

(Slide.)

This is for 1977, showing the reimbursement from the Federal Government being 82 percent of the university outlay for the project. These are minimal figures because they don't include the kind of thing that Dave Kipnis spoke about. We just don't have the data to really find out how many faculty members are spending 75 percent of time on a research grant and putting down 50 percent. We don't check up, and we don't try to. So these, I think, would be minimal figures. They are the ones that are available to the university accountants. One can debate individual items in the ordeal with the Federal auditors, but at least from our standpoint, we have to supply money in this year of $9.2 million for what we felt were out-of-pocket costs.

Now, within an independent university, you have to think of the possible sources of income--tuition, gifts, endowments, patient fees, and so on--and it's hard to see where this kind of money comes from. In 1977, $9.2 million was approximately 40 percent of all of the money that we received from endowment and from gifts that could be applied to the operating budget, as opposed to capital costs. Capital expenditures on buildings for research and major renovations are also excluded from these data.

But to round out this point, Washington University, an independent institution with finite resources available to it, has increasingly serious problems in funding the direct costs of research and the back-up space and services that are necessary to support the endeavor. Overhead income reimbursement is essential to our being able, effectively, to utilize Federal research grants, and that is not a matter of principle; we would be happy to provide more than the $9.2 million in unreimbursed costs if we knew how to do it. We just don't have that much money available. If we had a small grant, just one small grant, reimbursement for indirect cost would make little difference, or it could be handled within our existing budgets. However, when a third to a quarter of our time, effort, and facilities are going into Federally sponsored research, the indirect costs are considerable, and we have no other way to meet them.

With inflation under serious financial pressure in all areas, we feel that we've increased tuition as fast as we can, safely, and it's already much too high for families and for considerations of social equity. We can't meet our costs any more from clinical practice on the part of medical faculty without changing the nature of the institution from a research to a service enterprise. We can't really meet them by shaving faculty salaries anymore if we are to keep good people, and I have mentioned the relationship to gifts and endowment.

We are worried, continue to worry about the changes in A-21, all which we feel will hit Washington University especially hard, and we worry that that may further have an effect on our financial stability.

We realize that there is criticism of indirect cost recovery emanating from some faculty, from some persons within the Federal Government, and certain observers of research in the United States, and I think that some of that criticism is based on misunderstanding. We do have to maintain a certain administrative structure, physical environment, and intellectual capital, as has been mentioned.

Now, over the years, the costs of these things have become greater at Washington University. At our institution, at least, this change has mainly been due to what might be called "rent factors." I would like to underline that--space and equipment charges. There are also more people costs and more administrative costs because of extensive reporting requirements to provide data on the humane treatment of animals, provide careful protocols, et cetera, and things that have been mentioned.

The largest component at Washington University is actually what I was describing as rent costs, which in conventional commercial accounting might be, at least in some cases, a direct charge. Washington University's current 55 percent overhead rate--and that is of direct costs, not of total costs--55 percent overhead rate drops to 27 percent as an off-campus rate, and most of this is due to the absence of these facility and equipment costs, and it really would be easier to explain a 27 percent overhead rate and charge the rent directly. Between 1970 and '79, the rent factor in the indirect cost reimbursement increased by 11 percentage points, and that included more than a 600 percent increase in utility costs, while the other components, the nonrent components, declined by two percentage points.

I mention these changes because they do not suggest, as was suggested recently, that we at Washington University, at least, are building a huge bureaucracy, and of course we feel that most of our worthy colleagues at other institutions are not, either.

Now, there is another way of looking at overhead income, and that is to look at it from the standpoint not of the individual grant, not from the standpoint of the Federal Government, but from the standpoint of the university. How does that compare with the cost of our doing business? and I've got that on slide four.

(Slide.)

We have two campuses, and this shows that between 1974 and 1979, both campuses increased total income--Federal overhead income--and that the percent of their total income remained relatively constant and, in fact, fell. That is the percent of the total income--of overhead income compared to total income. Since the nature of Washington University has not changed significantly from the standpoint of the institution, now indirect cost reimbursement, to maintain their research environment, has not changed relative to other university costs; and it might be worthwhile for other institutions to look at it from this perspective.

Sometimes, if you look at something like this, you might think that all of the technical negotiations we go through are really for naught--that the research enterprise tends to be a relatively constant part of our activities and that we waste a lot of time; maybe we could just settle on some round figures. I know that's dreaming.

I wanted to just mention one other thing, and that is that we have talked about accounting for faculty time and so on, and I think that's a part of the complaint that I hear from faculties, but it's only a part of it. Another part that I hear, at least, is that we are putting more and more administrative burdens on faculty, of which accounting for the time is only a part, and maybe that could be borne if it weren't for all the other kinds of things we do, such as pushing them harder for better record-keeping, making sure that personnel in their department who are working for them keep better records, worrying about personnel matters, worrying about more reporting, more negotiating of budgets and so on.

One faculty member told me recently that he had thought in the last decade that the time he spent on that sort of thing had gone up one order of magnitude; and thinking about, as chancellor, the time I spent on that sort of thing--I have been chancellor now for nine years--it has gone up, I would say, about eight or nine orders of magnitude. At least eight or nine times as much of my present effort goes into worrying about these kinds of things as it did nine years ago.

Now, I have certain recommendations which aren't earthshaking, and some are just relatively minor, but which I think might help the system. One, I would suggest relating overhead reimbursement for the negotiated costs of maintaining the research environment to the total volume of research performed at the institution. In other words, I suggest that overhead income no longer be tied to individual grants. I don't see the reason for doing that. They are not negotiated that way. The present system of tying overhead income to individual grants leads to serious misunderstandings. Individual faculty members--not the most sophisticated, but some--feel they have earned the overhead for their institutions. They look on it somehow as a profit, as has been mentioned earlier this morning, with little understanding, at times, that it is, in fact, cost reimbursement.

Moreover, there are the problems of averaging. Overhead costs are averaged. In some grants it looks as if they are bringing in twice as much overhead as they cost, and it's true, and others maybe half as much, but you only hear from those who are bringing in twice as much, and this misunderstanding can get passed on to others. I don't think it should be impossible to uncouple these two things.

Another thing I wondered about, and this again, just for the purpose of clarity and to avoid misunderstanding, would be to have two overhead rates. We might divide the indirect costs, whenever we mention it, into, one, what I called rent--to cover the cost of facilities, heat, light, power, maintenance, and so on--and the other, administration to cover the nonfacility-related costs. Therefore, when somebody's overhead takes a jump, or you want to compare one institution with another, and people always want to do that, at least it might be a little bit easier and a little bit more comparable. I think it is wonderful for us to be able to handle our direct and indirect costs the way it seems most appropriate for individual institutions, but if there continues to be misunderstandings, that may be a luxury that we will have to give up.

Another, third, I do think it important to recommend that the Federal Goverment and its various agencies continue to consider the indirect costs as much a part of research as the direct costs. It is only realistic, and the basic problem is that appropriations really have to be sufficient to meet both these essential needs. For our institution, I really have to look at it as a total enterprise. We are not a university that is part of a system. Our indirect costs are not paid first by the State and then the money goes back to the State, but it comes directly to us. It is part of a total enterprise. And I would suspect, in Washington University, if we got twice as much reimbursement for indirect costs as we actually needed--I don't think that will happen, but if we did--that money would go back into the direct costs of research, because our faculty want better research. They want more equipment, staff, and supplies.

Another recommendation--one, I know, that we all are continuing to work on--is to simplify, and to continue to simplify, the reporting and accounting rules and regulations, particularly as they affect the faculty. Now, we have very excellent accountants, and they can follow all the ups and downs and understand everything, but it really is not a good thing to put these kinds of burdens on faculty. It does detract from the research enterprise when we turn our colleagues into administrators when they don't want to be. It doesn't make them feel good about the Federal Government or the university. It is a very wasteful thing to do, and somehow we ought to think when we put these burdens on the institutions how much of them not only go into the overhead rate, but how much of them go into detracting from the main function of being a faculty member.

I would like to close, as others have, by expressing appreciation to Don Fredrickson and to all of you for Washington University's being a part of these discussions.

DR. FREDRICKSON: Thank you, Bill. We will have time for some limited discussion of the St. Louis presentation. Howard Temin?

DR. TEMIN: I would like to raise the philosophical question of whether you feel, and then extend it to others, that the total cost, direct and indirect, of the NIH research should be recovered by the university from the Federal Government. In both of your presentations that was kind of unstated. But one could raise the argument that universities are interested in having research done at that institution. They try very hard to get prominent researchers who have these grants, and then it's always said--at least we always say to our legislature-- that people doing research are better teachers. Both the teaching and the service functions of the university gain from the research done there.

So it seems to me there is this philosophical question of whether the university should treat itself as merely a neutral broker that is just the place that this research, which is fully funded from the outside, takes place, and I would like your opinion about that.

DR. DANFORTH: I think I would like to give my answer in two parts, and let me say..... I would like the second part to be first: I heard in conversation at coffee a very clear and concise answer to part of your question from Henry Meadow, and rather than repeat what he said, I wonder if he would say it. Let me, while he's thinking about it, let me just say to the first part, another part of the answer, that I feel that our institution has made a major commitment to being a research institution. We have put an enormous amount of capital into facilities, and we continue to do that. We have put an enormous amount of resources into equipment. I spend a lot of my time trying to raise money, and some of that goes into equipment.

Our faculty are working very hard and do a lot better than I at raising money--raising it and earning it through various means--that goes into research. A lot of that is not shown here, and I think what we feel is that the financial pressures on us, with inflation, with the teaching responsibilities we have, at this particular time, that we can do with no less, with no further cuts in the Federal reimbursement; and that in fact, seriously, we would do much better with more reimbursement from the Federal Government in overhead.

We have about--let me just give you one other example. We have about 6,090 grants at Washington University. There are periods when groups or individuals need to be tided over. There are gaps between these grants; it is inevitable. That is not recognized in the overhead reimbursement. To recognize that sort of thing would be a tremendous help to us.

I have no philosophical problem with the universities meeting 100 percent of cost; it's just that we don't have those kinds of resources.

DR. FREDRICKSON: Henry, time has been yielded to you to answer the other question, but you must restate the question.

MR. MEADOW: I think that I would really be more interested, Don, in hearing what Bill Danforth heard me say.

(Laughter.)

MR. MEADOW: But he and I together can answer the second part of the question. I think we are what we are. In other words, each of our institutions has a certain commitment to a research enterprise that has other commitments to the other portions of this enterprise, and we can't grow and develop unless we have the resources to grow and develop with whatever balance we may want to maintain in these enterprises.

If we commit one to grow without adequate support for the institution, we have no recourse except to penalize the other portions of the institutional framework. If we do this--reduce the amount of indirect expense that we allocate in order to increase the direct expense--what we are going to do is starve ourselves to death, because we get larger and larger, and one of our limbs will get smaller and smaller than the others, and we'll fall over in whatever direction the larger limb is going to pull us. Now, that's not what I said, in those words, at coffee, but--

DR. FREDRICKSON: Henry, may I say, you are a wizard that sits and ponders these things many hours. Is there an optimal fraction of a university's budget or activities that should go to research? Can we follow Bill Danforth's example and scale down according to the unreimbursed costs till we get down to where we can reimburse the costs? Is that possible in the university?

MR. KELLY: Oh, but you can't get from here to there. If you get 82 percent consistently and you endeavor to save the 18 percent, you can only receive that balance at zero.

DR. FREDRICKSON: I guess those are hard numbers, by the way.

MR. MEADOW: My answer to your question, Don, is I hope not. I hope that each institution will make up its own mind as to what its optimal framework is and how it can contribute best.

DR. FREDRICKSON: Ivan?

DR. BENNETT: I would like to make some comments on the presentations we have heard from the institutions, because it seems to me that it might add to some understanding of what, if one speaks as an administrator, the options presently are. It clearly appears to be an advantage with one's faculty if one is able to say that our indirect cost rate is relatively low. On the other hand, that advantage may be outweighed by some of the things that have been mentioned. I quite agree with Julie Krevans that the more you can put on as a direct cost, the more likely the investigator is to nurse that money along. On the other hand, let me say that we reached a decision in my institution a number of years ago that rather than put on telephone costs as a direct cost, the whole institution, including the investigators, would be better off if we took that as an indirect cost, because the New York Telephone Company raised rates to the point that we had investigators that couldn't pay their telephone bills. That was the beginning of the realization that what has happened recently is that under the rubric of either what you could call the rent costs or the housing costs, plus the administrative support costs that enable you to write checks, to write pay checks, take out withholding tax and so on, and because of some of the reasons mentioned by Dr. Wilson, that the individuals who fall into that category tend to be from the class whose income we have tried up until now to preserve. In certain sections of the country, it is preserved by union negotiations, I might say. So that the reason that indirect costs have gone up more rapidly, I think, are really quite apparent.

On the other hand, the fact that one can renegotiate indirect costs each year during a time of inflation is a huge advantage over the inability, at the present time, to renegotiate direct costs. So I can make an argument to the effect that if double-digit inflation continues, then the higher your overhead rate-- It means that the management has seen that they have to throw those things that are being inflated over into indirect costs so they can renegotiate that reimbursement each year.

I just have a couple of other things I would like to say. The first is that I think everyone should realize that the indirect costs for which one is reimbursed by NIH, or the Federal Government, for that matter, represent only a part of the indirect costs of the institution, and the idea that because these are reimbursable, that the management of universities hasn't tried to become as efficient as possible, at least to save the part of their money that goes into that, I think is something-- Because you can't treat those costs differently from those you are reimbursed for; so that I haven't seen any difficulty in institutions trying to put in energy conservation plans, trying to get along with less maintenance and so on, because that's the only way to be efficient, and you can't manage that part of your business any differently than the way you manage the part for which the Federal Government reimburses you.

Finally, I would like to mention something that I haven't heard discussed here that I think really ought to be borne in mind, and it really has to do with the way in which NIH reimburses indirect costs as opposed to the way other Government agencies reimburse indirect costs; and if you want to hear investigators yell about what happens to the availability of funds for the direct cost of research, you ought to talk to people who are supported by the Department of Defense, because one of the things that NIH does, they set aside a pool of money so they can adjust these indirect costs to what the actual expenditures were. On the other hand, to take an oversimplified example, if an investigator gets from one of the agencies in the Department of Defense a contract which enables him to do basic research with a face value of $100,000 a year, 25 percent in the first of the three years is to go to overhead, and the overhead rate is renegotiated. The total amount of money that that institution gets remains $100,000 a year, and that increased indirect cost is taken right out of the direct costs.

Some of you may have noticed in the New York Times today an article that alleges that the Department of Defense is trying to woo universities back into the basic research game, and certainly there have been some increases there. I have been participating in this for the past four or five years, and one of the things I have not been able to convince them of is that their grants and contracts would be far more attractive if they would set up this kind of pool, so that when overhead costs go up, it would not come directly out of the investigator's funds available for research. And I think it is well to bear in mind that despite the fact that there are legitimate complaints about NIH reimbursement for indirect costs, that they actually have the most enlightened policy for doing this of any agency in the Federal Government, because at least you protect the investigator's direct cost, granted they are eaten into by inflation, but they do not change, despite the fact the overhead rate goes up.

But I want to emphasize that if double-digit inflation persists, the sign of good management in an institution may very well be a high indirect cost rate, because what you have done is to throw those costs over that tend to go with inflation so that you can renegotiate the reimbursement each year.

DR. FREDRICKSON: Leon?

DR. EISENBERG: I think the question that Howard Temin asked is the kind of question we have to satisfy the public with--that is, when a Congressman who makes a speech says, you know, "What do these institutions think they are? Here they want 100 percent, or more than 100 percent, for the very mission for which the university was founded." If he is a little fancier, he cites great philosophers and thinkers and all of the rest.

Well, it is my impression that universities are very pragmatic. If the Borgias or Medicis would show up and would be willing to support this research, I venture there are few who would refuse the money. Occasionally, a university is particular about where the money comes from--I think too infrequently, rather than the other way around. And the problem is that the research is no more pure because it is being supported by university funds than by Federal Government funds,and the issue is, the mission of the university is to do research. Unless you feel, or each of us feels, that our deans and presidents are less assiduous than they could be in getting money from some other source, then the demand for full reimbursement, or even more than full reimbursement to set up a contingency fund, is a legitimate activity in the interests of the very mission of the university.

I would like to suggest, though I am afraid it is a rather impractical suggestion, that what we ought to have is an NIH budget that Congress votes each year which is based on some estimate of direct costs, and then automatically to that bill is attached an uncontrollable amount which would be determined by the indirect costs of research. Then we would no longer have any competition between the two.

Now, as I said, it is a bit unrealistic, although the Congress has voted in a number of areas on controllables. That is, Social Security costs, welfare costs, Medicaid, et cetera, legitimately are not limited because they are considered a virtue; and if we ever got the principle that the support of the university, in order to create an environment in which the support that we are directly paying for was legitimate, one might avoid this kind of controversy or apparent controversy between the interest of two groups, the end part of which, of course, is the accomplishment of research.

DR. FREDRICKSON: There is the general belief that the NIH budget is one of the controllable items.

DR. EISENBERG: Oh, yes, yes.

MR. KELLY: You may have an idea whose time is not final.

DR. FREDRICKSON: Linda Wilson?

DR. WILSON: I would just like to point out that if that were followed, one of the fears would be that the institutions would manipulate their accounts so that more would be in the area that could be reimbursed; and it was suggested--and I think before you think that that's what universities could do or would do, you should remember that when we define what is a direct cost or what is an indirect cost, we do it for the entire institution for all sources of funds. So to move things into the indirect cost category in order to be reimbursed gets you reimbursement for perhaps 20 percent of your total gain. The other 80 percent in which you have dumped all these indirect costs, you have to find from other sources.

Similarly and on the other hand, if you direct charge these because you believe that will enable you to get better reimbursement from the Federal Government, then you must direct charge to all other sources of funds, and that means that you have no way in the institution of prioritizing between what you would like to do in this field and that field, because what is the direct cost or what is an indirect cost is not something that you manipulate among sources, and that is a fact which is often overlooked.

DR. FREDRICKSON: Dr. Wu?

DR. WU: This morning, Dr. Fredrickson introduced me as a physicist, and therefore I am sitting here as a bystander, but I am an interested and affected bystander--interested because this problem of cost accountability is a problem to all the science researchers, not only just for large science or medical sciences, and affected because, for instance, in Columbia, the university usually makes arrangements with one of the government agencies. Then the rest of them will follow that agency, as you say. So therefore, although all my research funds have come from the National Science Foundation and the Department of Energy, they very often just follow the NIH, the rules and regulations are negotiated with NIH.

Also, for instance--and now since Dr. Bennett mentioned this--in our large non-science, non-NIH contracts, many years ago, Columbia was only charged indirect costs and salaries, and then salaries and wages, and then go up to more than 50-55 percent, and then the theoretical physicists complained because, you see, they don't have any equipment. They don't use all the shops and everything. So suddenly I went to-- One year I had to make my own budget, and I usually send a young colleague to find out all the numbers, and he would come back and say, "This year the overhead is 22 percent." I said, "What?" But he said, "But the rest of them, all the equipment, supplies, and everything we also have to be charged, including our fringe benefit." It is salary plus fringe benefit, then multiple surgical center, for overhead.

Now, up to this year, this last year it was about 44, this year about 48, and next year will be again 54. You see the difference? Several years ago it was 54, only charging on salary and wages. Now it's everything. So I think this problem today I heard--at the very beginning--I heard that actually this involved the four components. In the Government, you have the Government programmer and auditor. In the universities you have the administrator and also the research people responsible. And today, probably, we are concentrated only on the latter two: the university administrator and the research principal investigator. Actually, let those young people join in. I usually let them see all the budget, and then they will know how to help me to save money.

Now, probably, in order to solve this problem, we have to have the four components all together and recognize this is an important problem. We have to solve it together, because you remember, in 1975 and '78, we fought so hard to reinstate the science advisor to the White House, and we tried to make the Science Bill. If you go back to reread that Science Bill, it was passed by both Houses. They said the research is investment in this country; it makes you cry to read it. They all realize that it's important. Then why should we only allow the research universities to do everything. University income is fixed.

And on the other hand, I think also faculty, research faculty, should have a say, too, because they are all using these monies. They know how to save; they know how to best appropriate these fundings. So I think the best thing--it's not that you can make a definite rule on how much the overhead costs for all the contracts. I mean, that should be negotiated between the Government agency and the university administrator and the principal investigator. You must let these research people have a say too. Otherwise, they feel so frustrated.

See, indirect cost is going up, up. Usually the limit, the total limit, is fixed, and so one expands and then shrinks, shrinks. Finally you can only pay salary and wage and you can't buy any equipment. How can you do research? This is the truth, particularly in the physical sciences; it is the truth.

So therefore, if you can invite them in when you negotiate or discuss these things, ask the research faculties in, and that will help a great deal. They may have some suggestions. At least they will not feel that they were pushed out and they have no freedom and control. At least they can feel that they have some control on this budget.

DR. FREDRICKSON: Thank you, Dr. Wu. We have three or four of you who want to talk, but I am going to let Jim

Kelly give the first part of his presentation today. Jim, can you take 10 or 15 minutes and use it as you like? You may be historical or hysterical, which is not typical of you. I will get back to the rest of you.

MR. KELLY: I would just like to join the others in saying how much I appreciate being here. About six months ago I moved into retirement, and my last job was to address the Association of Health Science Centers in Phoenix, Arizona, and my topic was "From Who's Who to Who's He?" And I must say, coming back as "Who's He?" to deal with this problem, I feel that if no more progress is made in the next 25 years, you can bring me back again, and I won't get that out of date.

I would sort of like to establish my credibility in talking about this problem first by saying that I had the marvelous opportunity to work in the Secretary's office from 1964 to 1970, and I had a very close association with the National Institutes of Health. I fell in love, so that I have somewhat stars in my eyes about the NIH. And having left the HEW, I then had the opportunity to serve on the Director's Advisory Committee under three different directors, and I think it was for a period of five years. I think that's illegal, but I enjoyed every minute of it. And in my final role, I was the Acting Chancellor of State University of New York, and I had a heart attack in Stu Bondurant's hospital, and I had increased admiration for the National Institutes of Health, because I remember when they financed the first heart intensive care unit; and then one year after that, I had a heart by-pass operation, and I again paid my respects to the National Institutes of Health. So anything that I say that sounds objective or unbiased is unreasonable and unfair.

I might also indicate, to establish my credibility, what some of my sins are in the area which you discussed. I was privileged to establish grants administration policy in HEW. I established Hank's operation of Grant and Contract Financial Management. I created the HEW Audit Agency. And Ernest Allen, who is here today, he and I were the major contributors from HEW to write the first A-21.

My penance was that I then went to Georgetown as Executive Vice President for Administration and applied these criteria, and then I went to State University of New York where I was the Executive Vice Chancellor, and for a while the Acting Chancellor, and I tried to apply these, and I had a heart attack and retired.

(Laughter.)

I thought I would mention that I really believe that an issue that we should discuss is accountability versus accounting, and then I made note that maybe of equal importance is establishing the distinction between nonprofit and unprofitable, because I really think that that is the essence of the argument.

I would like to start by saying that I think the best accountability that we have of the medical research dollar is the fact that in the period of the major development of the National Institutes of Health, if my information is correct, this country moved from a very backward, desultory position in the advancement of knowledge in the life sciences to a recognition today that no other country in the world approaches this country's contribution. If that's true, it's the best accountability there is.

It has nothing to do with direct cost; it has nothing to do with indirect cost. The question is, can we contribute to man's knowledge. Can we contribute to the prolongation of useful life or the diminution of premature death? Can we eliminate unnecessary and undesirable suffering or alleviate that, and are we preparing the next generation to further improve life, and are we developing the kind of options on life style that allow people to make intelligent decisions about their life and how productive and useful they would like to make it.

This, to my mind, is accountability. I think that some of the best accountability we have done is the engagement--I believe I am right--14 times we have engaged external sources to come in and evaluate what we were doing with Federal money in support of medical research, such as the Wooldridge Report, such as the more recent President's Biomedical Research Panels; and each of these has come out with some suggestions for improvements and with some criticism, but by and large has come out with very good report cards establishing that our use of public funds for this purpose has been wisely done.

As I look back--you really can go back, you know, on this issue to a laboratory in the Staten Island Hospital, I don't know, sometime in the 1880s, and that was just before my time; where you can go back to the Hygienic Laboratory, which was in Washington at 25th and E Streets, N.W.; where you can go to, what is it, 1937, when Magnuson and others introduced the cancer program for the National Institutes of Health, and the movement came to Bethesda.

Well, I would really go back to the period of 1953, and pick that year because it was in April of 1953 that the Department of Health, Education, and Welfare came into being. I now live in a section of the country which doesn't think that HEW is a great name, and so, you know, I tell people that I was from Georgetown University and not from HEW; and they had a marvelous editorial in the paper the other day indicating that they just didn't believe that the bureaucrats were so unimaginative that they would change the name from HEW to HHS.

But it is sort of appropriate to talk about the span from April 1953 to May 1980, because that's the lifetime of HEW. It is now all over, and a new piece of machinery comes into being.

When the Department was created-- I don't have access anymore to a good library, and so I had to depend upon memory, and that may not be very good--but my recollection is that in 1953, when HEW was created, NIH had an appropriation of about $59 million. The Clinical Center had evolved out of local cocktail parties and was under construction. The Cancer building was here, the central administration building and six or seven laboratory buildings, and that really is about all--and the Wilson house.

So from that point to now, with a total appropriation of some $3 billion, has evolved the whole concept of how you do this; and I think that looking back you really have to pay tremendous respect to the administrators who, with very limited funds, made some profound decisions. I think that some of those significant decisions that were made are worthy of being examined and either modified or marked for continued support. One of these decisions was that, rather than undertake an expanded medical research program in this country in Federal laboratories, that the predominant effort would be made to do it in non-Federal laboratories, but that unlike a lot of the other research--such as the National Science Foundation or, if you will, the new Department of Education--that there would be conducted also a significant amount of intramural research. This was later identified as roughly 10 percent of the total program, but the major decision was that research would be supported in non-Federal laboratories.

A second major decision was that those non-Federal laboratories would not be predominantly research laboratories, but they would be a utilization of the educational institutions in the United States, both to capitalize on the environment, and utilize the talents that were there and to build upon and expand the existing capacity to perform research.

A third, and I think profound but misdirected, decision was that we would use the grant mechanism rather than the contract. The reason I say misdirected is that I believe we made an error of judgment in the development of the grant in not truly making it a grant. We made it a reimbursement contract with an upper limit, and we called it a grant. The fact of the matter is that the Federal Government, and NIH in particular, makes more desirable contract arrangements with profit-making institutions than they do with the nonprofit making organizations that they set out to develop and to support, and it seems to me that that is the issue that we are now dealing with; and it's not an issue of indirect cost, it's not an issue of direct costs; it's an issue of the fiscal health of the institutions on which we have placed reliance to carry out public policy.

Well, you can go on in this stream. The one thing you do know is that you have to find a way to weed out and eliminate fraud. Fraud and misrepresentation will destroy a public program, and so wherever this exists, it must be weeded out, it must be eliminated, and no educational institution can do anything except support the programs that are designed to weed out fraud and misrepresentation. It is the most destructive thing that occurs in the execution of public policy.

Now, a second and distinct thing from fraud and misrepresentation is the question of efficiency and economy of performance. This is a goal to be desired. This is a goal that is not achievable. You can improve it, but you will always live with a high degree of inefficiency and uneconomical conduct, so that your job isn't to deal with this as if it were some form of an absolute, that you can walk in and say, "Well, that is inefficient, that is uneconomical." You can't do that; it's only a direction. Fraud and misrepresentation, I deal with as an absolute. It is a matter of attitude, and when you confront it, you must deal with it head on. In terms of inefficiency and uneconomical operations, I think that your movement has to be in the direction of improving it.

Now, let me just see if I can identify how I think that this guides you. As I indicated, I participated in the creation of the HEW Audit Agency, and I guess that I have been accused of being the father to a monster on many occasions, and I do believe in some fundamental changes in policy. Let me just say that one of the people that I most admire helped modify these policies, and that was Elliot Richardson. Elliot and I worked together when he was the Assistant Secretary for Legislation of HEW, and then I spent only a few months with him after he became secretary; and one of the things that he did that I was sorry I didn't stay here to counsel him on was to indicate that in order to constrain the HEW budget, a more substantial and significant effort should be made to recover the funds that have been identified in audits as improperly spent, or so-called audit exceptions; but this is a major policy modification that has occurred since the origin of that organization, and everybody wouldn't agree with me, including some people in the room that were here at the time.

But I had a view, for both philosophical and pragmatic reasons, that when the audit identified a problem, if it was fraud and misrepresentation, that there should be an immediate step taken to correct that and to correct it retroactively. The money was improperly spent it didn't belong to them; and whether or not you turned it over to prosecutors, whatever you did, you should just burn it out of the system. You can't afford to have it. But when you were dealing with the question of wisdom of expenditure--dealing with the question of economy and efficiency in the organization--it was my view that you should deal with the problem prospectively. As I say, philosophically, I think that this is the wiser way to do it, but pragmatically, it is extremely important.

I met with the school authorities in one of the major school districts in the United States, and one of the largest States in the United States, on an audit issue that involved $15 million of funds that were considered to have been improperly spent; and when I indicated to them the change in policies and procedures that I thought should be undertaken in order that this kind of problem would not occur in the future, they said to me, "Do you mean, if we make those changes that deal with this problem, then we don't owe you $15 million?" And I said yes, and I will tell you, within 24 hours, they had adopted a new set of policies and procedures.

I entered another dispute in one of the major universities in the United States which was very similar, and it involved over a million dollars. The issue was, you have to pay it back, but there was also a series of recommendations of the changes that you should make; and the net result of those negotiations was, if we agreed to make the changes that have been proposed, we would be admitting that we spent a million dollars improperly and that we owe it to you, and there is no way in the world that we can make that admission, so we can't change the policies and procedures; and four years later the same set of inefficient and uneconomical arrangements were still in place because that was the best defense against agreeing that you ought to pay it back. So for very pragmatic reasons, I believe that the evaluative system should be one that is designed to make tomorrow better than yesterday and not try to make yesterday better than yesterday was; and I believe if this attitude were taken, and if what in fact we have is a partnership arrangement between the colleges and universities and the Federal Government in fulfilling a public objective, it seems to me that this is far and away the wisest course of action.

I particularly believe this to be true with respect to time-and-effort reporting. Sometime in the middle to latter part of the 1960s, a delegation of deans of medical schools from AAMC, they visited me, and the issue was time-and-effort reporting, about which I didn't know very much, but I learned a lot. So I agreed to have a study made, and we undertook a study of a selected group of institutions, and we found that something more than 95 percent of all of the time-and-effort reports were identical with the estimate of time that was included in the grant application, and I just think that the discipline that brought this about is absolutely astonishing. But it establishes, it seems to me, that it's really not a very useful exercise to require time-and-effort reporting if that is the outcome.

But let me say that the incentives to make it come out that way are absolutely tremendous. If you employ a faculty member who is 100 percent engaged in the sponsored research, and he's supported by five grants, each of which he's supposed to spend 20 percent of his time on, and some event occurs that causes him to skew his time so that he spends 50 percent of his time on one project and 12.5 percent on the others, we have a very interesting outcome. The university now has to fund 30 percent of his faculty from university funds, because the grant on which he now spends 50 percent of his time, rather than the 20 percent that he agreed upon, can only receive a maximum of the 20 percent. And for the ones where he is now spending 12.5 percent, rather than 20 percent, they are only going to pay for the time he spent, and the net result is that you end up with 30 percent of his time that isn't covered by any sponsored program. It isn't included in the university's budget, but the university has to come up with it, and that, it seems to me, is very unwise. You have established incentives such that being honest is a terrible detriment, because it is a one-way street. We only allow it one way.

It wouldn't bother me if the aggregate of all Federal-sponsored funds had to be met or you had to pay it back, but to say that every individual project has got to meet that kind of test, it seems to me, is an unreasonable position to take, and all of the incentives move in the wrong way. Now, let me just point out that, on the other hand, I think the idea that a person doesn't know how much time to charge to an individual project--given all of the problems--you know, that he is engaged in teaching, research, and patient care--it is phenomenal that he knows exactly how much to charge in a grant application, but he doesn't know what to charge after he has gotten the funds; and I just think that the same principles apply, and I really am not that sympathetic with the concept that we don't know how much to charge when we knew how much to ask for.

So I really think that the issue of time-and-effort reporting should be nothing better than an indicator of how time was utilized in order to sharpen the judgment that we use to apply in subsequent grant applications, and to indicate that the institution should be seeking modification of their grant proposals to be more in relationship to how actual time is being spent; but I do think that time-and-effort reporting, as it is now perceived, is a very unwise policy. I read the new A-21, and perhaps the monitored workload system does offer some promise of dealing with this in a wiser manner, but I myself have a great deal of skepticism on the wisdom of trying to do finite accounting grant by grant. It would seem to me that it would be sufficient to identify that the aggregate of faculty time that is supported by sponsored programs is in fact applied to sponsored programs, and that it does not have to apply to each grant individually.

A study that I participated in at the Institute of Medicine on the cost of health professional education indicated that, sort of contrary to the popular wisdom, a substantial amount of research funds are not directed towards objectives other than the research objective. In all of the institutes that were selected for the conduct of that study, only one institution--and unfortunately I do not know its name because we were only given numbers of institutions--but only one institution demonstrated that there was a lesser degree of effort related to sponsored research than income derived from that research. All of the other institutions in the study--nursing, dentistry, medicine, pharmacy, all of them-- demonstrated that the resources obtained from sponsored programs were significantly less than the amount of time-and-effort for the proportion of institutional activity devoted to the conduct of research.

This kind of study, it seems to me, is a more useful method of approaching accountability than the effort to do finite accounting. It seems to me that fraud and abuse, we should wash out; that improvement of economy and efficiency should be our goal, and it should be a prospective goal, rather than a retrospective goal; that we are in need of visualizing the concept that our role in the use of these public resources is to improve the output, and if we can improve the efficiency and economy, we have made these funds go farther; that we can do more in accumulating knowledge; and that we have a strong responsibility to move in the direction of fiscal health of the institutions that we are dependent upon.

I have a suggestion along those lines: When the Medicare Program was developed--was it HCFA?--the Advisory Committee on Medicare came up with a judgment that was really developed by a former budget director who then became the President of Brookings and is now deceased, in which he took a view that was an economic rather than an accounting view; and he persuaded everyone to allow the full cost of depreciation of buildings and equipment, irrespective of whether those facilities had been developed with public funds; and his argument was that the purpose of allowing this was not to pay somebody back for the funds they had invested, but to ensure a continuing, viable instituion that can provide patient care.

Now, he had a view that was not brought about; that that should go into a funded reserve and be used for capital improvement and for the viability of the institution, and that hasn't yet occurred. I believe that we would be wise, in the indirect cost policy, to arrange for a full allowance for buildings, facilities, and equipment--but to require that the institutions demonstrate that the funds are being used for the purpose of improving the facilities; extending their useful life and updating the equipment. The only really free money that is available to an institution is the funds that they obtain for the depreciation, but that's only on the facilities which they put up. If the Government put it up, they don't get anything for it. I'm saying I would change that: Give them the funds for depreciation of all buildings and facilities no matter who paid for them, but require that those funds go for the perpetuation and improvement of physical facilities.

I think that the whole research establishment in the United States over the last ten years has declined appreciably because of aging facilities and equipment, and the resources have not been as good as they were in the preceding 10 or 20 years for creating the kind of plant and environment in which the best research can be conducted. I think it is very difficult to go and seek the funds to do this, but this is a methodology that would provide the funds and utilize them in ways that would enrich the physical facilities in which research is conducted, and I could go on and on, but I see that the 12 minutes Don gave me has elapsed.

DR. FREDRICKSON: Thank you, Jim. I am delighted that our advances in medical care kept pace with your need for them. Jim Kelly will be back after the 5:00 o'clock news for a brief summary, but there is just a moment of time to catch up on some commentators. John Sherman, you were cut off there at the pass.

DR. SHERMAN: Not all the creative accounting has been on the academic side. There was a bit in the Congress that has left us a legacy that hasn't been mentioned in the context of costing out research, particularly vis-a-vis the institution's contribution, and that is cost-sharing. Don, it needs to be examined, I think, in terms of the circumstances which brought it about and the purposes which may or may not have been fulfilled by a decade of its presence.

DR. FREDRICKSON: Mr. Meadow?

MR. MEADOW: You may be interested in knowing that the actual cost-sharing of the administration's appropriations bills this year all permit--the three bills that contain cost-sharing provisions--all permit cost-sharing to be implemented on an institution-wide basis rather than grant by grant, which has been the case of several of the agencies in the past.

DR. FREDRICKSON: Kenneth Brown? Do you remember what it was you wanted to say?

DR. BROWN: Yes. I was a little disturbed a while ago to be misquoted as having seriously suggested we should decrease the indirect cost allowance. I have never made such a suggestion. But I am much more disturbed that I don't think we are addressing one of the most important problems in this whole matter. Mr. Kelly suggested, I think very wisely, that we should concentrate on the future. Well, if we look at the picture that we developed in that little study from the figures in NEI, what we see is that over the period from this last decade approximately, the increase in the indirect cost allowance has dramatically decreased the amount of funds that are available for the direct costs of research.

Now, I think we have to take it as basic that the funds that are used for the direct cost of research are the heart of the entire research program. They are the reason that we have a research program. This is the money the taxpayer has put up, and they are interested in having it used wisely to produce the most and the best research that they can, and so we have got to be interested in the direct costs of research, and I have heard very, very little about that today. There has been a great deal of talk about the indirect costs, but I don't see any addressing of the issue that the present mechanism whereby the indirect and direct costs are determined is such that with the rising cost of the indirect aspect, the direct is going down.

Now, maybe we can tolerate that up to a certain point, but it seems to me that what I pointed out this morning is a very important indication that we are already getting to a critical level. We have already gotten to the critical level where faculty are becoming concerned, and I have heard a great deal of misquoting here also of the reason for the faculty concern: It is not because of how the money is spent on indirect cost; it is because of the fact that the money available for the direct cost of research is decreasing and faculty are becoming more and more aware that this is one of the reasons why that is occurring.

So I think we have to be very concerned about the process, and the way the process has operated over the last ten years, and what that is telling us now about what's going to happen in the future if nothing is done. In my view, unless something is done to change the nature of the process, then it's inevitably a runaway situation; and I have heard suggestions that would amount to major increases, perhaps, in the indirect cost allowance and even a suggestion that a large indirect cost allowance was an indication of a healthy system. But this completely ignores the fact that in that situation the direct costs are going to be vastly decreased, and while we haven't yet reached crisis proportions here, I do think that is the absolute heart of the problem and cannot be ignored.

DR. FREDRICKSON: I think it is a corollary to what you say, Dr. Brown, that you certainly believe that the indirect costs are not as necessary as the direct costs for the conduct of research. Does that not follow from what you say? You're not convinced from what you have heard or seen. If that is not true, then how otherwise can you reconcile your concern only with the direct costs? Do I make myself clear?

DR. BROWN: I'm sorry. I really don't understand your question.

DR. FREDRICKSON: Perhaps someone else can rephrase it. Jim Kelly?

MR. KELLY: Yes. I was going to suggest, Dr. Brown, maybe you look at the problem from a different vantage point--that the advent of increased cost of doing business without a corresponding increase in the resources has decreased the resources that are available for research. This distinction between whether it is direct or indirect is still dealing with the question of the cost of research.

Then let me say that I really don't have enough data, I suppose, to give you any authoritative analysis, but on the basis of my experience with national associations and with Georgetown and State University of New York, I would conclude that the increase that you show in your report from 31 percent to 41 percent over a ten-year period in indirect cost, in all probability, is representative of two things: One, I believe that the most significant change that has occurred in that ten-year period in university costs is utility costs; and the utility costs in a university would be very much greater than they are if it had not been for the extraordinary measures that have been taken to try and conserve utilities. But I think one figure given today was that there is a sixfold increase in the amount of money that's going into utilities. If you took utilities out of the picture, I think you would find that you don't have as appreciable a change as you indicated.

If you remember looking at the Washington University figures, they showed that you went from--in terms of total indirect cost in the institution--that in the medical school you went from 10 percent to 9.7 percent, and in the hilltop or nonmedical school you went from 4.8

percent to 4 percent, so that, in fact, indirect costs of sponsored programs didn't go up; and I truly believe, I just know, that in State University of New York, you can take a period of 15 years and find that administrative and fiscal management is 5 percent of the institution, and operations and maintenance exclusive of utilities is 4 percent of the institution; and that two major shifts occurred, one of which you treat in indirect costs and the other in direct costs, and that is the cost of fringe benefits: Social Security doubled, and the cost of utilities went up, somewhat quadrupled.

Now, the other element that could have occurred in that 31 percent to 41 percent is, as financing becomes more difficult, as sources of funds become more difficult to find, you tend to refine your data and to seek full reimbursement without any cost having gone up. You now are identifying--you are going to find Dr. Danforth saying that that $9.2 million, he wants it, not because the cost went up by $9.2 million, but because he has been funding that $9.2 million from some other source, and he wants it from this source. That is not an increase in cost, now; this is merely a recognition of cost, and I myself believe--I know that everybody here doesn't--I myself believe that we have greatly overstated how much the costs have gone up because we do more refined accounting, because we do a lot more auditing, because we've got OSHA, because we've got Affirmative Action. I think those costs are very limited.

I know that in one of the papers that was distributed, there was an indication that the cost of financial management had gone up more than the cost of the financing itself, and I must say I don't think the cost of financial management has gone up by as much as 1 percent in the last 20 years.

DR. FREDRICKSON: Dr. Brown, do you want a rejoinder, and then we will move on to the rest of the agenda.

DR. BROWN: Well, this is a very complex issue; but first of all, the indirect cost allowance that we are talking about in that study has nothing to do with what one would compute as the actual indirect cost, but is the proportion of the total budget of the individual institutes which is paid right off the top into indirect costs and, therefore, is decreasing the amount of money available to the investigator for direct costs. If that is a false point of view, you will have an extremely difficult time explaining this, but I would be very glad to try to--

MR. KELLY: Well, let me just try one time again. If you have two principal investigators that both make $50,000, and you have to pay 50 percent of that for indirect costs, and that is $50,000, so now this adds up to $150,000.

Now, say you only have $75,000. You end up that you have one principal investigator with $50,000 and indirect costs of $25,000. You don't take $50,000 off the top; you only take off the top a proportion of the direct. So the total amount of money that's available for research is diminished by increased cost, and then that amount is divided proportionately between direct and indirect, and it is a mistake to believe that if you had a $150,000 program, with $50,000 for indirect costs, you take that off the top, and that somehow or other the direct then fell from the $100,000 to $50,000. That's not the way it works. If the direct falls from $100,000 to $50,000, indirect falls from $50,000 to $25,000.

DR. FREDRICKSON: We will get back again, Dr. Brown, on this same subject. It is very important. I do want to keep on schedule to the extent that we can. We are changing the agenda because of the late arrival of Fred Bohen. I would like to welcome Hale Champion who has just come in. We are next going to hear from Mr. John Lordan, who is the Chief of the Financial Management Branch of the Office of Management and Budget. And, Jim, you said you were the father of A-21; I guess I thought Mr. Lordan was, but at least he is its curator right now, as far as I know; and we are delighted to welcome you here, Mr. Lordan, to give us some thoughts on cost principles for educational institutions from the OMB vantage point.

MR. LORDAN: Well, every play needs a villain. It's not at all unusual to introduce him in the second act. If I can avoid that role, though, I'll strive vigorously to do so. Jim Kelly did admit to being the father, or at least one of the principal authors, of A-21, and father of the HEW Audit Agency. Hale Champion had the dubious distinction of transmitting the proposal for the revision of A-21 to us--and that reminds me of a Casey Stengal story. Casey was chastising his center fielder for an inadequate performance, and to show him how to do a better job, he took the field himself. The first ball went through his legs, the second went over his head, and the third fell out of his glove. Casey returned to the dugout and threw the glove down and said, "You've got center field so screwed up, nobody can play it!"

(Laughter)

MR. LORDAN: That's not to suggest that Mr. Kelly and Mr. Champion left us with a Circular A-21 that was beyond redemption, but I think you will all admit that when we began that task of revision, it was a formidable chore. It began--for those of you who haven't the sense of history that Mr. Kelly has--it began over four years ago with the recommendation by the House and Senate Appropriations Committee that HEW reexamine the cost principles and make recommendations to OMB for the revision of Circular A-21.

Those recommendations were made, and when the new administration came into office in 1977, the Department took still another look at what had been submitted, made some revisions, and resubmitted them to us. We circulated those widely for comment to university groups, to affected Federal agencies, and to others that we knew would be interested.

We received, in addition to a lot of technical comment, we received what was, in effect, a counterproposal from one of the university groups. We provided that the same courtesy, distibuting it again very widely for comment; and based on both of these proposals, and on what we learned in over a year's time in considering the comments and discussing the potential for revision with various groups, OMB finally constructed a proposed revision.

We thought it an eminently fair and reasonable document. We soon found out otherwise. That one was published as the first OMB suggestion for revision in the "Federal Register." We made this a public process, held public hearings on it. And we met with more university groups, I think, than one would care to count. It's an interesting phenomenon of universities that they probably have more groups and associations than any other similar number of individuals. I met just recently with a group that is made up of the presidents of other university associations, and I have no doubt that before we are through, there will an association of the wives of presidents of university associations with whom we have to deal in one way or another.

Finally, though, after what I think was a very constructive process, after an exchange of views with a very large number of individuals and groups, after receiving and analyzing some 300 comments from members of Congress, from Federal agencies, from universities, their associations, professional groups, faculty, researchers, administrators, the broad spectrum of individuals likely to be affected, we did revise Circular A-21 in March of 1979. We called for its implementation in October of that year, suggesting that it be phased in at the beginning of the next fiscal year at each of the institutions that would be responsible for implementing. So we are well into an implementation phase. It is useful, I think, to have discussions like this, to hear about some of the implementation problems, but I think it is important that you understand our view, that it is a job completed. The Circular has been revised, and some of the problems that you may be facing on campus represent your task, your step in the process of implementation.

We are, of course, open to suggestions for additional revisions of the Circular. We always are. The National Commission on Research has suggested that the Circular be reconsidered in from three to five years, and certainly it will be. We have accepted that recommendation in testimony before the Congress, and if there is a merciful God, perhaps I won't be there at the time, but OMB is nonetheless committed to making that examination.

In the meantime, though, there is a considerable amount of work to be done by the universities in finding ways to reasonably implement what represents a fairly broad set of cost principles. They are not the detailed kind of cost accountability requirements that one would apply in a procurement situation. They surely are not very close to the Armed Services procurement regulations that Defense uses, or the Federal procurement regulations that the civilian agencies use, or the cost accountability standards issued by Congress's Cost Accounting Standards Board. In fact, we went to some pains to negotiate with the Cost Accounting Standards Board for relief for universities from their requirements. Even though universities may be receiving national Defense procurements covered by the Act, they are nonetheless relieved as a result of a coordinated action with the A-21 revision--relieved from complying with those standards which are in fact designed for an industrial environment and which would be very difficult for universities to pick up and implement.

At each step in this process, I think we have been mindful of the reality and the charge of excess paper work, and in analyzing comments, we were particularly sensitive to assure that the Circular itself did not impose additional paper work. As some examples: The simplified method for small universities for computing overhead was extended to a higher dollar threshhold. The monitored work load, which Jim Kelly expressed some optimism for, that method of keeping track of personnel costs requires far less reporting than had been the case heretofore. The reduction in the frequency of faculty personnel activity reports--again something which I think we may lose sight of occasionally.

In the past, Circular A-21 called for personnel activity reports on a monthly basis. That has been trimmed back, now, to reporting once each academic term, a considerable reduction in the frequency, a considerable reduction in the burden that paper work imposes on faculty, who indeed would be better employed in their research than in paper work to justify reimbursement from the Government.

Let me point out, though, that the great difficulty that appears to be emerging on campus is not that of documenting the direct charges to research. The division of effort that Mr. Kelly referred to that is made in a proposal and then subsequently reported is not the major problem. The major problem is rather with documenting those elements of cost which are only indirectly reimbursed by the Federal Government. The reason that the various categories have to be introduced into campus forms is that the university wants to recover, and indeed is entitled to recover, every cent that its cost accountability documentation will support out of the principles in A-21. So the sharper the university administrator's pencil--the more precise their accountability--the more difficult the burden of supplying documentation becomes to the faculty. We would be delighted, we in the Federal Government would be delighted to have less paper work if universities wanted less cost recovery. We have said that from the beginning.

(Laughter)

If we could devise a standard rate that would be acceptable, somehow voted on by the multiplicity of associations as a rate that would apply to all grants, and if it were one that would leave us as a Federal Government whole with regard to the cost of research--of course we would embrace it. But we know, as you know, that as soon as we did, all those who are higher than the average would rush in with their calculations, with their documentation, the paper work they have imposed on their faculty to demonstrate that their rate should be higher than the average, and the only ones who would find the average acceptable would be those who had a pretty good idea that their actuals were less than the average.

Jim Kelly made a point about the importance of stamping out fraud and waste in any government programs. Certainly we all can endorse that, but let me add that it is also important to establish a measure of credibility with respect to costs that are being charged to the Government. That is, it is not enough to say that a certain amount of money went to the university and they did a certain amount of research but we are not quite sure what they did it on, and we are not quite sure that it was done consistent with 100, 200, 400, 500 grants that are in place on that campus, because people tend to look at things one at a time. Certainly auditors do, and that is the role they are playing in our Government; and investigators from Congressional committees tend to look at things one at a time, and reporters tend to look at things one at a time, and in fact the taxpayer has a right to look at things one at a time. We have got to have credibility in the charges that are being borne by the Federal Government. We can go a long way toward simplifying the paper work, reducing the burden. This administration is very committed to doing that. We tried to do it on A-21. We have tried to do it, as you know, on Circular A-110, standardizing a whole range of administrative requirements that in the past were represented by various and conflicting regulations of individual agencies. But we've got to have some credibility--to go back to the Congress, back to the taxpayer--that the charges to the individual grants are consistent with the way they were proposed and the way we were told they were going to be carried out.

It isn't enough to stop at the threshhold of fraud and abuse. We've got to do more than that, because this isn't Government money. This isn't some free resource that is being allocated by the Office of Management and Budget or by the President; these are hard-earned tax dollars that we have to take away from people. We've got to explain to them why it's important that we take it away.

The budget situation that we face today is well known to all of you, and the prospects of what we are going to face in the next few years are not encouraging with regard to liberalization of Federal spending. There will be tight budget constraints, and it's important that we show the people that we are getting a dollar's worth of value for every dollar that we have to take away.

So let me just close with the idea that as we see the task now, it is for effective implementation at the university level of the principles in A-21. There will be blunders in that. There have been many already. I have seen some of the forms that have been proposed by individual universities and distributed to their faculty, and I would scream, just as the faculty has screamed. The level of detail that is required is the level that we need or that you need to support those charges when you're reviewed. But that doesn't suggest that everybody has to have the exact same documentation, the exact same forms. I think administrators will have to run some risks, as we have, in this project and as researchers run some risks in doing their work. If you have suggestions for how the Circular may be revised, we would be delighted to hear them. I would only ask, though, that in formulating those suggestions you not emulate some of the associations that have passed very general sorts of resolutions and statements of position without getting down to specifics.

There is a line in "Ship of Fools" where the protagonist is describing a wayward sister, a woman of easy virtue, and who apparently has been away for some time, and he says, "My sister and I communicate now exclusively by rumor." It may have been adequate for his purposes, but it is not for the Government in communicating with you or in your communicating with the Government. I think it is important to go back to original sources--not to react to editorials, not to react to letters from individuals--but to look at the provisions of the Circular itself and its application on your individual campuses, to see what implementation problems you may be having, and if those problems are severe, then come to us with suggestions as to how the problems may be corrected.

I thank you very much.

DR. FREDRICKSON: Thank you, Mr. Lordan. I hope that you will be able to stay until after coffee just for some discussion.

MR. LORDAN: I will be here the rest of the afternoon.

DR. FREDRICKSON: Great. That being the case, let's take a break and come back at five minutes to 4:00.

(Brief recess.)

DR. FREDRICKSON: Let's reconvene, if you please. We now have some time for discussion, questions, comments directed toward or at or around Mr. Lordan. Estelle Ramey?

DR. RAMEY: Well, I have a couple of comments about Mr. Lordan's remarks. First, I would like to say that I was rather impressed with his generosity towards the university, which is rather unique for OMB in my experience, in that he says he was not going to apply the stringent rules that applied to purchasing for the Defense Department. Well, I wish they would apply such rules to it, and then provide us with the cost overruns that are available to the Defense Department. I think in that case we wouldn't have had to have this meeting, because all universities would be grateful to be subsidized for cost overrun.

The second thing I would like to say is on a personal matter. I was rather interested that Mr. Lordan felt that it was terribly amusing that in the situation which he is in, he might, with all these people who are at his door, have to speak to the wives of the presidents of various organizations. I would like to suggest to the representative from OMB, considering the negative impact that OMB has had on research in this country, we might be better off if he spoke to the wives.

MR. LORDAN: I stand corrected and chastised.

(Laughter.)

DR. FREDRICKSON: Leon? Lee Eisenberg?

DR. EISENBERG: One of the major sort of philosophic issues that seems to divide us is the notion that somehow the university's effort in research in particular ought to be judged by criteria somewhat similar to, whether looser or tighter, than those that would apply to other businesses with which the Government deals. This sort of got started, it seems to me, in the '50s, when Mr. Fountain chaired the House committee that identified somebody who was going to Naples and having a good time, and someone else, I think, who had used some NIH money to buy liquor, et cetera, et cetera.

What that discussion, I think, completely overlooked was that the number of outright frauds--I agree strongly with Mr. Kelly-- is rather small, to the best of my knowledge. At least it's terribly clever fraud, because not very much has been identified up to now.

What I would like to suggest is that perhaps a single university might be supported by the Association of American Universities or other sources to look at its overall enterprise and to consider both the cost of government auditing that goes into monitoring the research activities of that institution plus its own internal auditing mechanisms--to respond to that, and consider it in relationship to unjustified costs that are periodically identified, to see whether or not it might not be much more efficient, given a general history of work, and given the fact that the research enterprises are in fact reviewed one by one, even if the accounting, in my view, need not be, because then one either delivers reasonable research or doesn't, and if one does not, one is not likely to be refunded.

We are justifiably criticized as arguing in our own self-interest, at least those around this table who manage large research funds, but I think it also has to be understood that every other sector of the society has similar self-interests. Lawyers generate lawsuits, accountants generate accounting principles--and the more this multiplies--I am not suggesting that this is a deliberate intent, any more than the underemployed neurosurgeon who does more diagnostic procedures because he has time to fill, is necessarily aware of what he does, that the accountant who generates more accounting requirements in order to make jobs for his brethren is sort of only using that as a motivation but it is a kind of mentality that from various points of view each of us has; and I would really think it might be worth the experiment to look at the overall consequences in the operation at one reasonable institution.--it ought to be a Midwestern or representative or average or whatever institution, not the richest, not the poorest, et cetera--to see whether, in fact, one could make a reasonable case that would be ahead of the game.

I am really distressed by the extent to which litigiousness in this society has generated the notion that in order to catch the occasional miscreant, it is worth tying up everybody else so much of the time.

In our own State we have seen, in a much different matter, the extent to which individuals suffer now because you cannot turn off a tube or a pump or a machine with someone who is comatose without going to court because somebody might do it to realize money from the will; and for that rare event--so far as I know, it is a rare event--where that kind of fraud would be involved, lots of perfectly ordinary people are made to suffer for months at a time and large costs are generated for society.

So I would think it would be worth a look as to whether we can't get a better result at a hell of a lot less money with a lot less tying up of everybody, the Government and private sectors, by seeing whether there isn't a better way to proceed than looking at every damn number.

DR. FREDRICKSON: Mr. Lordan?

MR. LORDAN: If I may, I think Jim Kelly put his finger on it right at the beginning of his remarks--that sometime ago, we as a government and you as universities started down a direction which leads us to where we are today. That is that the amount of the support will be tied to the cost incurred. That was a carryover from procurement. The connection to assistance probably didn't make very much sense then, but not much thought went into it. Now we find ourselves supporting a multibillion-dollar enterprise on that same concept without having established that that is the best way to do it. If we could return to the idea of a fixed amount to produce a certain research project--a fixed-price grant, if you will, something of that type--we would do away with the need for accounting and the litigiousness that you refer to.

Let me just say this, though, with regard to accountants producing more accounting principles to employ more accountants. I don't take this as a very good defense, but I point out that my background--and I don't advertise it very much these days--but my training is as an economist. So although we have made some mistakes--

DR. FREDRICKSON: That is a dismal thing these days.

DR. EISENBERG: I admire your honesty.

(Laughter.)

DR. EISENBERG: We make that an arts degree now instead of a science degree.

(Laughter.)

DR. FREDRICKSON: Further comments? Dr. Kipnis?

DR. KIPNIS: Several of my colleagues said it is not worth making them, but it makes me feel better, I guess, and one has to feel better about certain things. In response to some of your comments, I must admit I don't follow them. The issue of credibility came up, and as far as I am aware, credibility has never been between the public and institutions--

DR. FREDRICKSON: David, could you just speak louder?

DR. KIPNIS: Yes. The issue of credibility came up, which was the basis for many of the kinds of techniques for auditing that were about, but the credibility, it seems to me, between the public is between the public and you and not between the public and us. So that is a question I don't understand, and what I also don't understand is how one goes through such extensive deliberative policies and yet the things the faculties are concerned about are not addressed in A-21.

For example, the issue of workload: By not having the faculty necessarily report more than once a semester is, in essence, a negligible item, frankly, because in all of those grants, the faculty constitutes only a very small portion of the personnel. So it hasn't really changed. One is still having to do monthly reports on all nonprofessional personnel, and it becomes extremely difficult to allocate on a monthly basis if there is more than one research grant in a given laboratory. And the amount of manipulation required is excessive, and I don't think that what is done here helps the issue of credibility or helps identify fraud. I think it's an extraordinary workload that was not addressed, and I will be quite frank with you, I have to be convinced that it's there for a fundamental reason of accounting rather than a policy.

The next one is that, as far as I can see, these guidelines penalize institutions devoted to delivering what the public has requested--research. Any institution that aggressively goes out to expand resources to accommodate what the public wants is being penalized in terms of how it can collect those costs; and I think the NIH has identified at least those two, among others, and I don't understand how a Federal agency, in response to repeated letters by all the groups that I know of, including deans and chancellors and professors and whatever other groups you want to call, can justify what they did, unless it is a means of administratively imposing a policy that had already been predetermined, and that is the credibility that you lack with us. Now, I'd like to have some explanation for that.

MR. LORDAN: Well, let me address that credibility issue by quoting Chairman Fountain who has been mentioned here earlier: He said, in introducing hearings last summer, "Institutional accountability as measured by Federal audit findings appears to be a serious and growing problem. Federal agency audits of universities and other educational institutions in recent years have identified very large amounts of Federal funds which the auditors believe were improperly expended, and even larger expenditures which the auditors could not verify because of the inadequacy of accounting systems and records of the schools involved."

That's the kind of credibility issue we're addressing.

DR. KIPNIS: Yes, but-- In the classic course of philosophy, that would be said to be predetermined because you set up the audit criteria for which Mr. Fountain is going to have to pass a judgment. It is absolutely absurd, for example, for auditors to go into an institution and say that they can't verify 95 percent of the salaries that were expended on research, and that's a comment that one sees published in "Business News" and other areas; and I would suggest, therefore, that maybe Mr. Fountain hasn't looked very carefully at the details of the auditing procedure. But of course, if you set up an auditing procedure which is very rigid and therefore doesn't come out the way you want it, it's obvious that one is going to have doubts. I just think that is circular reasoning, and the credibility is one created by the technique.

MR. LORDAN: Well, it's neither you nor I nor Mr. Fountain that has set up the standard. The standard is set up in the grant agreement, and that is mutually negotiated between a Federal agency and a university, and to come back then and say--

DR. KIPNIS: I wonder how many people around here would say that those standards have really been set up in the grant agreement. Most of the institutions are arguing all the time that they're doing what they said they were supposed to do, and the auditors are saying they're not doing what they are supposed to do. I don't know, maybe people with more senior--

MR. LORDAN: But the idea of demonstrating what was done is the thing that is agreed to in the grant--that is, that 50 percent of the effort (an illustration that we heard earlier)--50 percent of the activity of an individual would be devoted to the research. Somebody comes along later on and says, "Was 50 percent devoted?" And the university says "Yes, because we have this record to demonstrate it." That's really the standard that's being applied. If it is an unfair one, then you and we are entering into lots of transactions which we consider at the outset to be unfair. That may be the case, and maybe that's the dilemma that comes from Mr. Kelly's point about the--

DR. KIPNIS: I can tell you of one instance that I was told of, that when an investigator justifies it, then the investigator is asked, "Did you watch this individual at all times?" I mean, it is unending. All I am getting at is that there are games we play. That doesn't pick up the fraud, by the way. That just, in essence, creates the doubt which sets the inevitable mass of machinery into activity which ends up exactly creating more doubt that creates this. I mean, as far as I can see, that's why I've always been unimpressed by the tools-of-the-trade. Not just the accounting. I mean, medicine has got a lot of tools-of-the-trade that most of us have serious questions about, too, unfortunately.

But what about the other one, about organized research--that is, institutions that vigorously seek alternative sources from State, from private--and foundations now have that put into the base upon which reimbursement is scaled--and yet that means that the institutions that vigorously pursue efforts to create the environment to carry out public policy get punished.

MR. LORDAN: I'm not sure I understand that, but if it is that nonFederally funded projects should bear their fair share of overhead too, I think it is your administrators that have made the case to us, most successfully, that the Federal Government should pay its full cost. Are you saying that we are the only ones that should and that foundations and others should not?

DR. KIPNIS: Frankly, yes; but that's another philosophical debate. But absolutely, absolutely.

MR. LORDAN: But if it's a philosophical debate that--

DR. KIPNIS: Because after all, a charitable money is only after the tax cut, so that--I mean, that is other philosophy. But I would like to hear other people, because that is my understanding of the A-21 rules, which have imposed a unique load, and therefore let me point out to you: What, in essence, you are saying is that it has nothing to do with accounting; you are making policy decisions.

MR. LORDAN: Well, I don't know. The accounting rule would follow that if we have two projects of equal size and one overhead base supporting them both, that they should each bear an equal share, regardless of who may be financing one or the other. Now, that is the most neutral accounting principle one could apply. So I am not sure what ominous policy initiative would drive the accounting in this case.

DR. KIPNIS: The cost of research is the cost of research. For some people you just don't recover your costs. We run our homes that way all the time. Some children need more love than others.

DR. BONDURANT: Can I just pursue, Dave, your example to be sure I understand your point and the question. Let's say there are two $100,000 grants or contracts in two different institutions, one of which has twice the amount of non-Federal Support in the base--in the denominator of the fraction that is used to calculate the rate. Will they be treated alike in terms of indirect cost?

MR. LORDAN: Does your example assume that they can both operate with the exact same level of overhead?

DR. BONDURANT: Yes.

MR. LORDAN: Well, then the answer is yes. But the argument that you have made successfully to us is that overhead varies with the volume of work, and therefore, as we give more grants, we should pay more overhead. Now, if that doesn't hold up, then your illustration is a valid one. But I think it does hold up. I think over a period of time, overhead does increase as you take on more work.

DR. BONDURANT: Well, I think the point is that there may be factors other than either of these that you are now mentioning which determine institutional behavior, and so from the perspective that Dr. Kipnis is advancing, there is a powerful lever buried away in here which is a disincentive to institutions to act in the national interest by sustaining research at a time when this nation has got problems more generally in terms of retaining its research base.

DR. FREDRICKSON: Linda Wilson?

DR. WILSON: Let me say to my colleagues that I am pretty sure I am correct in this, that what John is saying, in terms of the accounting, that it is absolutely correct in the accounting principle that if you are trying to share indirect costs as an averaging cost, that you would treat non-Federal funds and Federal funds alike and you would try to attribute indirect costs associated with the non-Federal funds and indirect costs with the Federal funds, and that is perfectly good accounting.

I think what you are saying is that in terms of overall national policy to get the world's work done, that that is a major disincentive and it is dysfunctional. The major problem that I have seen with our A-21 is that we haven't set down and sorted out the policy and the general accepted purpose or even the objectives, and yet we do have a set of accounting principles which are now driving the policy rather than following from the policy. But it is absolutely correct in terms of accounting principles.

There are a number of other facets of the new A-21 which are also absolutely true blue in terms of logic, but their net result will be a traumatic adjustment, disruption of equilibrium, and diminution of the research capacity of this country; and that's why we've got to get the cart before the horse instead of vice versa.

MR. LORDAN: But, Linda, the reason that's the case is the original premise--that the amount of the grant equals the cost. Congress appropriates funds on that basis.

Universities justify their grants on that basis. Having done so, then it falls to people to define conventionally what costs mean. We could make up all kinds of bizarre rules as to what costs should be if we were pursuing only public policy objectives and could ignore the fact that Congress said to pay them their cost, but having said that, we are constrained by the principles of the profession.

DR. WILSON: That's the second piece of the problem--that we are treating this as a procurement situation, and we really need to address that.

MR. LORDAN: Sure.

DR. FREDRICKSON: Estelle?

DR. RAMEY: The Government consistently makes philosophical distinctions between monies and other aspects. It does it in the way in which it taxes income. It does it in the way in which it sets out its Social Security plus earned income or dividend income, and regards income in many different ways. That's the Government making these decisions on a philosophical basis, and I think what Dave Kipnis is saying is very important, because when private monies are gotten by an institution, very often those private foundations, or in some instances individual donors for research, are very reluctant to give money that's going to be used in large amounts for overhead.

And so if, indeed, you can engender more funds from people of that sort without this particular kind of constraint, it eases the burden ultimately, it seems to me, not only on the university but on the Government itself. So if you look at it in the long haul, aside from being a disincentive for the university to go out and--or individuals--to go out and get the money, in the long haul, it is actually making it more expensive for the Government in terms of having to support more of a percentage of the funding than it would have if it made these adjustments. I just don't buy the business that on the basis of accounting, a dollar is a dollar. It is never "a dollar is a dollar" in accounting, in my experience. It just depends-- It's like beauty: It is in the eye of the beholder. It just depends on where the dollar is coming from and what you want that dollar to mean.

MR. LORDAN: I didn't mean to suggest that the Government couldn't make those kinds of public policy determinations. The two examples you used are matters of tax law which the Congress explicitly considers and passes. If the Congress wanted to explicitly consider and pass a set of cost accounting principles more to your liking, we would be delighted to implement those. All I am saying is that there are restrictions imposed on the Executive Branch by the way in which the Congress provides these funds; and having provided them in such a way as to instruct us to develop cost accounting principles to determine what these things cost we are constrained by rules of the profession--which you may not be persuaded is very scientific and which of course has some elements of judgment in it, but which does follow some kind of rules that are intelligible to those who are trained in them.

DR. FREDRICKSON: Dr. Krevans?

DR. KREVANS: I would love to hear and learn more about this. Is there something in the cost accounting principles that forces you to say that a Government grant to a university has to be thought about as the same as a gift to a university?

MR. LORDAN: No.

DR. KREVANS: Well, if Mr. Zilch gives Dave Kipnis a million dollars to do research, why do you have to account for it at all?

MR. LORDAN: Well, there is something in accounting principles which says that if an overhead activity is supporting two projects and supporting them in an equal way, that the cost should be distributed between the two. You are talking about the income side, and I am talking now about the expenditure side. We don't account for the income from Mr. Zilch, but we do account for the cost of carrying out the project that Mr. Zilch wanted carried out and the cost of carrying out the Government- sponsored project, and then we distribute--again at your urging, having made the case that the Government should bear its fair share of overhead--we accept a share of the overhead on the Government-sponsored project.

DR. KREVANS: But if we don't ask the Government to pick up the overhead for Mr. Zilch's gift, why should you care?

MR. LORDAN: Because the implication is--

DR. KREVANS: I want to see where we do--

MR. LORDAN: --in carrying out those two projects, you needed a larger overhead enterprise than you otherwise would. Now, if that is a fallacy, then the whole concept of the Federal Government paying a proportionate share of the overhead is a fallacy. We have accepted that premise, and we expect the university to accept it as well.

DR. KREVANS: So in order for you to, in a sense, treat the gift monies separately, you would have to have a legislative instruction from the Congress to order you to treat it separately? There is no way within the general framework of the instructions to the Executive Branch that they could make a policy decision that it was good for the nation to encourage Zilch to give this dough, and that therefore it was going to be given as an advantage to the university and they would account for it differently? I am asking.

MR. LORDAN: The answer is no. We have no interest whatsoever in the gifts that Mr. Zilch or anyone else may give to the university. If they can generate those sources of income, then that's fine. It is when the university chooses, then, on the basis of that source of income, to carry out a project much like the one we are paying for, that we say, if you have to increase your overhead to do Mr. Zilch's project, as you told us you had to increase your overhead to do our project, then we expect both of the projects to bear a portion of the overhead.

DR. FREDRICKSON: Warren Bennis?

DR. BENNETT: Yes. Let me start with a general and very quick statement or an assertion and then raise some questions with you, and really I am partly recasting these questions, all of which I think actually betray or reflect an assertion of many of the remarks made by my colleagues here, especially Dr. Eisenberg.

I think one of the reasons for this sort of a question and response and some of the defensiveness in the air is just the fact that at the time when there seems to be a decline in research funds available, at the same time there is also a great deal of what you might call obligatory and even, in somes cases, suppressive and expensive paper work along with--that is a terrible combination--both a decline of funds and a decline of autonomy.

One thing I think I could say by way of some of my own research, is that where the market forces play too active a role within the research enterprise, the research usually suffers; and another is that poverty, in general, isn't very good for the character, which accounts for the general mood that we experience.

Starting off with something Dr. Eisenberg said, the question is, Do you really think that you can apply, quote, "cost accounting methods" to institutions of the research enterprise without trying to say that we are so precious that we have no surveillance or no anything? But that's question one. Do you think you can use the same kinds of measurements?

The second question is, the difference between a system of accounting and a system of auditing. It strikes me that what we are talking about primarily now is not so much an accounting system but an auditing system. It's really checking up. And within that system, is there a way of creating more incentives rather than disincentives? Because what I fear will happen is that it will--and this is the assertion part of it: It really goes against the grain of a research atmosphere and a research environment, you know, in some very basic ways, to the point that many key investigators are just saying "To hell with it. I am not going to go through this," causing a lot of dispair.

I guess another one is that the problem I find with some of the systems created--and the one we're talking about is no exception--is that-- There's a line out of an old poem, I think written in the '20s, by T.S. Eliot, where he was really taking off on technocrats and industrial engineers who were just then emerging as the new leaders, saying, "Those people who try to design systems so perfect that no man need be good." And it's sort of a footnote to what we're doing. And I'm of course agreeing with Mr. Kelly about there having to be some system for detecting fraud and so on, criminal behavior, obviously; and perhaps we ourselves should take some blame--that is university administrators--for not having, in a way, policed things internally well enough, which always invites the external, right?

But I have a sense that the systems are going to have some important, hard-to-measure effects on the whole research enterprise. I think this is really the mood, and this has really got to be answered and somehow or another dealt with.

MR. LORDAN: To quote from another writer of that same era, "It is a world we never made." To discuss these things in isolation from what is happening elsewhere in the Government and elsewhere in the country, I think is a mistake. There is a mood of accountability; there is a great suspicion among us, and regardless of my feelings toward universities or your feelings toward bureaucrats, that's not going to change very much. There are a lot of people out there who are very suspicious of what you do and very suspicious of what I do and who don't think we are worth it at all, and somehow we've got to operate between us in a way that reflects this Administration's strong commitment to research, and I think if you look at the budget figures, it is pretty obvious that that commitment is there. If you look at the extraordinary lengths that we went to to try to get your views on this revision which was being urged on us by the Congress, then I think you'll see that the commitment is there. The trick is, it seems to me, for us together to be able to give assurances that there is accountability without overburdening the kind of people you are talking about, in an atmosphere where the country and each of the groups in the country is very suspicious of one another.

DR. FREDRICKSON: Linda Wilson?

DR. WILSON: Let me describe for you a little bit of the history on this cost-sharing. What is disturbing so many of my colleagues now is a change. Now, it's not a change in rules imposed on you; it's a change in interpretation of what is required, because for many years, places like Washington University managed their money and did their accounting with the Government and were given a seal of approval by their cognizant audit agency that the way they were handling their funds, private and public, was okay.

Suddenly there is a new A-21, and it says, "New Rules." Now, the new rules, in your mind, are still consistent with the way the whole system was organized, but there is a tremendous disruption that is going to take place in that institution because of this change, and it's a disruption which will not be valuable for research. So that's one major problem.

The next thing to look at is to what extent do we really have a large disallowance problem? The Inspector General's report from 1978, which came out in March of '79 pointed out something like $86 million set aside for which the accountants, auditors were not satisfied that there was adequate documentation even for them to decide whether they were good or bad costs. It turns out that of the total amount of dollars they audited in that period, that was about 5.7 percent. The report was on audit findings, audit reports, not audit resolutions, so one can assume that some of that would be rebutted successfully by the institutions.

If you look at what they pointed out as improper charges--that for which they found documentation sufficient to be sure that it was improper--it was less than one percent-- I think about 0.23 percent of all the charges they reviewed, and most of those had to do with difficulties over time-and-effort reporting. So if we could get ourselves agreed on time-and-effort reporting, all of that would go away, and what is already a rather small problem, in terms of percentages, would go down to zero. So it seems to me, that should give us heart, if we could somehow get a better agreement on time-and-effort reporting. Universities would be extremely credible. I think five percent, while it sounds large if you are talking about $86 million, is not very material in terms of the total scheme of things. In fact, DHEW's imposition on many institutions now, they want to define the word "significant" to mean five percent. So one should put that in perspective.

I think what we really have is a problem in management technology. We have a very complicated system in universities. That's not to say there aren't complicated systems somewhere else, but we don't have a good technology for deriving the costs and dealing with them. We should either find a better technology or back off from the demand that it be on a cost basis. It seems to me it is probably simpler to do the latter, because the other one takes somebody around somewhere having a major new creative idea, and we can't manage that into existence.

MR. LORDAN: I agree with both those points absolutely, because most costs, ultimately, are personnel costs.

DR. WILSON: Right.

DR. FREDRICKSON: Henry Kirschenmann?

MR. KIRSCHENMANN: Yes. It seems to me that we are approaching this from two completely different perspectives. It seems to me, from what I hear today, that the universities are saying to us, "You ought to be funding our institutions as resource centers primarily, and the fact that we have project grants is incidental to the idea of funding the institution. The NIH grant system and other grant systems in the Federal Government are based on the premise that we will fund individual research projects which are conducted in a research center.

Now, the cost principles associated with those two approaches are completely different. If we took the approach that Jim Kelly has suggested and funded salaries and wages, in a broad context, a large sum, we would have considerably different cost principles than we have now with funding individual project grants. The individual-project-grants concept is something which has been around for as long as NIH has had research, as far as I know, and I think it is pretty well established in the law, and it certainly is well established in the minds of the peer review groups.

So there's no point in arguing, it seems to me, whether or not the accounting concepts that we now have are appropriate until we establish that the mechanism that we use to fund is the appropriate mechanism. Cost accounting principles under A-21, even though there are many things in there that I disagree with, do reflect project accounting.

The other purpose of cost principles is to provide to management--to your management and our management here--an identification of what the costs are that are associated with the conduct of any one of these projects; and there is no question in my mind that much of these costs in the past have not been known. I think it is a real awakening, for example, to the National Institutes of Health to find out what it's really costing to use students on research projects, or to use animals on research projects.

Now, given the fact that it's costly doesn't argue either for accepting it or not accepting it, but it is a fact which, it seems to me, those individuals need to know in making judgments about whether or not they are going to fund a project and to what extent they are going to fund a project.

DR. FREDRICKSON: Stuart Bondurant?

DR. BONDURANT: Mr. Kirschenmann, if I understood you correctly, I would like to take exception emphatically to your interpretation of at least my part of the comments today, and I think I am speaking for several other speakers in the sense that I believe you misunderstood some of the points that we've attempted to make. I believe that the-- But I think you've helped to focus the issue. I don't think that anyone of the academic types around the table today has been attempting to argue for institutional support through the project grant mechanism in the sense that you used it in your opening statement. I think rather, the point is that, in the view that's being put forward, the project grant has a necessary component, a necessary and legitimate component of institutional support, and that this is a proper and legitimate device, and that if project grants are to survive over time in the country, it is necessary to build that component in.

So I suppose, in a sense, we're coming back to Jim Kelly's earlier point on whether the proper mechanism was used, or whether it would have been better in the first place to have had a contract--as you pointed out, I think, Jim, in your earlier comments. But I do think that the sense or the intent--the tradition--has certainly been, and the sense of many of these comments has been, that the work of the project grant itself requires the existence of the institution and the support of the institution, and no cost accounting can tease those things apart in any way that will allow the project grant to go on in a meaningful way.

DR. FREDRICKSON: Leon Eisenberg and Henry.

DR. EISENBERG: I would like to ask Mr. Lordan whether or not the OMB has the authority to do experiments--that is, accounting experiments-- and I would really like to seriously propose that your office consider changing the rules in several different institutions by, you know, negotiation, in an effort to see whether the net result--in terms of assuring yourself of legitimacy of expenditures, et cetera, et cetera, and the university being satisfied that it recovered costs or whatever--could be more effectively met.

One of the problems all of us have--and it's a serious problem with social legislation--we never try them out, we just do them; and then well into them we find we have all kinds of trouble. It's even difficult to get a mock-up. I mean, within our own university there was big discussion within the faculty recently about changing a certain faculty rank. I must say, I was rather perturbed by the discussion, and I said, "For goodness' sakes, let's pretend we have it, and let's ask a number of large departments to see what would happen to their present disposition of personnel if they really made the change." And when it was tried, before it was passed, all hell broke loose because they found that it didn't work the way they thought it was going to work.

I would really like to suggest that we believe in research. You say you believe in research. I mean you collectively; I don't mean you personally.

MR. LORDAN: And have given evidence to that effect.

DR. EISENBERG: Okay, fine. That's right. You get that money out to us. For goodness sakes, we believe in it so much, we even believe in it for you. We don't think the fun of doing the stuff ought to be restricted to us, and so we encourage you, now, to become the principal investigator. I'm sorry, I'm getting a bit carried away.

(Laughter)

But you might really, quite seriously endeavor to try out some other way of working it and seeing whether it wouldn't be cheaper and better for all concerned. That's number one.

Now, number two: You did understand, I'm sure, the point that was made by several people here that was exemplified in my own experience in a small way. I had difficulty getting the trustees of the Mass. General, when I was at that institution, to accept a grant that we got from somebody in the private sector who refused to give any overhead costs, and I was rather astonished when our trustees were reluctant to accept what I thought was free money because in fact it was going to cost them something for the reasons here. Clearly, then, they finally did, because it was a small amount.

MR. LORDAN: And that was presumably before the revision of A-21.

DR. EISENBERG: Yes. I'm sorry. It was before the revision. Now, my question is, it is clear then, from an economist's point of view, that this is a disincentive, that the institution in fact loses some of its recoverable Federal funds. I would put to you as a citizen at some point, the challenge as an economist to redesign the rules to put back the incentive for the university to go and get outside money. In other words, instead of your telling me I can't do it, I now turn to you as a man with certain technical skills and say, "This is what we would like to do. Design a system to get it done." Don't be like the administrator who once told me when I got research money and we didn't have space, "If you had listened to me, you never would have done it." Well, for goodness' sake, the point was to do the research, and we went out and rented space.

MR. LORDAN: Your example, as most of the examples we have heard here today, assumes, say, a one-university world, and in fact, if Mass. General had rejected that gift, it probably would have gone to some other worthy, deserving university that was willing to bear the burden of the very small increment of overhead that they would have had to forego.

Your first point about the experimentation is something that I think we ought to take seriously. Like most things in Washington, an experiment of that kind would take money. OMB doesn't have money appropriated for that purpose, but certainly universities do, and I wouldn't be surprised if NIH, as one of the funding agencies of the Government, might want to give that some consideration. I would tie that back to the original point that Jim Kelly made--to the distinction that I think he made originally and that has been attributed to him--that we might have been better off if we had chosen to go contract instead of grants. I would like to ask Jim if that was really the distinction he sought, or was it the distinction between cost reimbursements and fixed-price.

MR. KELLY: I would like to have gone to fixed-price grants. I really think that what we made was, we did the grant with the view that we were creating a more attractive arrangement in a partnership with nonprofit institutions than the arrangement we had in procurement with profit-making institutions, and I think we ended up making it a less attractive arrangement than we originally thought it would be, and I believe in many respects a less attractive arrangment then the procurement arrangement for research that we have with profit making.

DR. FREDRICKSON: With respect to that research you are going to do, Mr. Lordan, would you like a price-fixed grant or--

(Laughter)

MR. LORDAN: Well, that would certainly encourage me to get it finished in a hurry.

DR. FREDRICKSON: Linda, did you have another comment?

DR. WILSON: I was just going to tell you, as a preview of the next Commission's report, which will be out early in June--is now at the printer--there is a recommendation for experimentation with what I think John Lordan means by fixed-price grant, but which we don't call that because it has a lot of knee-jerk reactions with other people. A grant-in-aid is what we labled it. What we have in mind is the same procedure that is now followed with people putting in requests with a budget that indicates what they believe it would cost to do the work, using the word "cost" loosely, and then if the award is made, the only responsibility the institution has is to report technically.

Now, it's important that the institutions and the investigators here recognize that that suddenly shifts the argument home in your own backyard for the university and the investigators to sort out all manner of problems we've been able to pin on the feds, and it will not be trivial to work that out, but the Commission believes that it can be handled.

DR. FREDRICKSON: Frank?

DR. ABBOUD: Mr. Lordan, I am very concerned about the comments you made that suggest that one of your motivations for the procedures is to allay suspicion that you think exists in the public, vis-a-vis universities. Your motivation is based on a lack of faith, on suspicion. It is a negative attitude to take when you are dealing with a group of people who feel they are just as much accountable to the public as you feel you are.

MR. LORDAN: I have expressed myself badly if that is the way you understood me. I meant to say that we operate in an atmosphere where the people who drive my actions--that is, the Congress and the public--are very suspicious of the segments of society, of me as well as of you; and that the auditing concern that was raised, and people asking for more and more documentation have to be viewed in the context of those forces working on them, just as they are working on the other segments of the society. You can't look at the university/Government relationship in isolation from other relationships in the country at the time.

DR. ABBOUD: I would like to think that we can educate the public a lot more instead of working from a position of lack of confidence, lack of faith, and I mentioned that in my presentation this morning. We spent a lot of time this morning indicating that the actual cost that is charged to the Federal Government for research is in fact less than the cost that universities carry. There is a lot of hidden cost in the formula that we were talking about. We spent a lot of time indicating to you that the accounting procedures you're proposing will increase indirect costs. That has to decrease the net amount of money left for the support of the investigator. We keep indicating that that's driving away young investigators from research and will eventually hurt the total enterprise.

Now, I've got to ask you, because you're very important in this whole formula, which is more important to you: to be perfect in cost accounting, in your procedures, or to decrease the vitality and creativity of a university? It is going to have to come to that. You've got to answer that question.

MR. LORDAN: But you leave no room for a reasonable response. The question dictates the response. Certainly there is a broad area of gray between those two extremes, and we all find ourselves operating in that area, and I think the trick is to find that level of accountability that is satisfactory to Government decision-makers, to the Congress, and to the public, and doesn't impose a disproportionate cost on the institutions. That certainly was our objective. If we've failed, we're open to suggestions as to how we might do better. But certainly our objective is precisely the way you state it.

DR. FREDRICKSON: Estelle?

DR. RAMEY: I think we loosely speak about this public suspicion, the public demand, and that sort of thing. The fact is that every poll I've seen has indicated public support of increased research to cure--if you put it on the basis of to cure cancer, to cure heart disease--always goes in the direction of the fact that the public wants to see more research done that will ultimately lead in that direction. They will even support basic research. I'm not sure I would agree that there is a very high level of suspicion in the country, specifically about scientists. There is a lot of suspicion about practicing doctors, which has been well earned; but the fact is that there is not, in my opinion, a great, a high level of suspicion that the scientists are wasting a lot of money and the like in the life sciences. Every time the newspapers put on the front page something about interferon and cancer and that sort of thing, I invariably hear comments like, "Why aren't we putting more money into developing all kinds of things like that? Why are we spending it on welfare," or something of that sort.

But the fact of the matter is that it's very easy to rely upon something called the level of suspicion and then translate that into accounting practices with which accountant feel very much more comfortable than using some of the other techniques that have been suggested.

So I would just like to say that I'd like to be shown what that level of suspicion is and how it's manifested and how you count it.

DR. FREDRICKSON: Mr. Lordan?

MR. LORDAN: I'm sure there's a group of practicing physicians meeting elsewhere in this city who are making equally uncharitable remarks about their colleagues in research. The issue, I think, is not the support of research--not support of the cancer cures or other research objectives--which certainly there is great support for--but rather the overhead enterprise necessary to carry those things out, and I have little doubt that if we had a referendum on whether the Federal Government should be supporting university overhead, that would be viewed very negatively by the same respondents to polls, just as when you ask them about Government bureaucrats you get very negative reactions. It is really not the direct cost of the research that so much of this controversy involves, but rather the documentation and support for the infrastructure that you need at the institution to carry out that research.

DR. RAMEY: It depends on how you ask that question. I'm not so sure that if you ask the question so that it was understood that one has to pay for electricity and all the rest of the support of research, that the citizens of the United States are so stupid that they wouldn't understand that that's an essential part of turning out these great scientific discoveries.

DR. EISENBERG: No, but isn't the point, in reconciling the difference, one of unfortunate terminology. It has come up all the way through. It's not your fault; it's everybody's fault, ours included. Distinguishing "direct" from, quote, "indirect" or, quote, "overhead cost" allows some scientists to say, "Why are they ripping me off and putting the money--?" I mean, it comes back to what Mr. Kelly said: If the public understood that this was a part of the cost of producing this or that marvelous cure, they would buy it. But if they see it as overhead to support a limousine for the university president....

MR. LORDAN: Right, and I have an equally high regard for the intelligence of the American people. I just point out that some of your own faculty have not been educated on this issue.

DR. EISENBERG: Hear, hear! That's what I've said. That's exactly it.

DR. FREDRICKSON: Henry Meadow and then Bill Anlyan, and then we'll have Fred Bohen.

MR. MEADOW: I think what we've heard over the last two minutes is a very interesting demonstration of this something which seems to pervade our society at the moment. One is the lack of credibility on the part of one group for what the other group seems to say it wants to do, and the other is the fact that we seem to like adversary proceedings more than we ever did before, and I wonder if this meeting can't be said to have begun to resolve some of this conflict, if you will, in the sense that I think we are all agreed that there has to be some level of accountability, both scientific and fiscal.

Dave Kipnis defined, I think very elegantly, the problems that the presently requested type of accountability cause for a practicing scholar, or a man who is responsible for practicing scholars; and I wonder if, with this as a beginning, in looking at the system problem that Jim Kelly posed, we can't begin by assuming that all of us want to solve the same problem and begin to get on with the solution.

DR. FREDRICKSON: Thank you, Henry. Bill Anlyan?

DR. ANLYAN: Well, I'll make it short, because I think Henry said-- I am interested, too, in getting away from the adversarial position, and now that you have sort of precipitated a crystal with A-21, I wonder if it wouldn't be worthwhile visiting selected campuses or research universities to see what the impact has been. We would predict that it's going to make things more difficult than ever before for us to get fewer dollars.

The other thing that's important, which is hard to put on paper--which I think my colleagues down the table have been trying to express--is the frustration of the scientists out there in the trenches. This is just one more straw in terms of saying that we have to do this for achieving perfection in accounting principles, legal technicalities, and added to all of the other things that have been mentioned earlier today--the OEO, the EPA, the OSHA, many of which are very fine things. This is what is really going to kill the scientific goose in the research universities.

So I would hope to eliminate the adversarial position. And some of you, come around to the research universities and take a look at the trenches, because we have to work together.

MR. KELLY: You mean the places where they're dug in?

(Laughter)

DR. FREDRICKSON: I think we must move on to the--

DR. TEMIN: May I make one sentence?

DR. FREDRICKSON: Yes, Howard?

DR. TEMIN: It seems that a great deal would be helped if we changed the terms "direct" and "indirect" to "incremental costs" and "averaged costs."

DR. FREDRICKSON: Creative, creative.

DR. TEMIN: That would really change a lot of the connotations that seem to be so troublesome and that still don't seem to be understood by everyone, even around this table, much less on the outside.

DR. FREDRICKSON: Let me see if--

MR. LORDAN: Much better than the distinction made by Adam Smith between productive costs and unproductive costs.

(Laughter)

MR. KELLY: I would just like to comment on that one.

DR. FREDRICKSON: All right.

MR. KELLY: I think that when all of us started in this business, we believed that there was such a thing as incremental costs and that's what we would fund. I believe there is no informed person who has studied this problem that believes there is such a thing as a measurable incremental cost.

DR. FREDRICKSON: Fred Bohen, who is the Assistant Secretary for Management and Budget, has had a busy day, and I'm grateful to him for managing to get all the way out to Bethesda somehow, despite all of the distractions downtown.

Fred, you are at a disadvantage: Everybody has discussed almost everything, but still there are the perspectives of the Department, as compared with the OMB, compared with the agency, the universities, and the scientists on accounting, accountability, and A-21 in particular, so there is still, doubtless, something for you to say. Would you like to go to the podium?

MR. BOHEN: I would just as soon speak informally at the end of what I gather has been a long day for you, Don, and your colleagues. I had intended all along to speak informally, and the events of the last 70 hours have made a necessity out of what might have been a virtue.

Let me say that I recognize and apologize for arriving very late in what has been a full day. When Don first approached me with the notion that he would devote this meeting of his Council to this subject, I welcomed it and said the Department would be a full partner and I would be personally a full participant, as much to learn as to philosophize about these problems. In the meantime, my office in particular and the Department in general got into a $335 million controversy with the State of New York, and we've been trying to drag back those dollars dollar by dollar, and as against that controversy, the ones that swirl around this table may be mild, may be mild indeed.

I would like to talk a little bit about the philosophy of the Department approaching this issue--some of the pressures we feel--and then really let those of you who have spoken earlier, and want to make sure that I have heard the points that have been made, repeat them.

We are, I think, a little surprised at the anticipatory reaction of negativism to the new A-21 principles. There was a lot of feeling in the university community, as well as the Government, that the prior circular had defects, and there was a long process of consideration--hearings in Congress, dialogues between the Government and the university community--that led to its revision. I wasn't personally involved in that, but Hale Champion, who is here, was actively involved on the part of the Department; and none of us would pretend that the final product was one that satisfied everybody, but it certainly was a product that was open to a tremendous amount of consultation. We've now had a year to get used to what has been written down, as well as what was not written down, but really no experience in concrete situations and in knowing, for example, whether the proposition that you advanced is true--that the actual implementation of that circular will lead to either higher or lower indirect cost rates and therefore higher or lower amounts of money available for research or any of the other empirical propositions that a year or two from now will be testable through experience on both sides.

So I think that the sense of great anxiety comes to us, as I gather it comes to OMB, as something of a surprise. We think that in many ways the circular is improved, that in many way it has been made less onerous. The element of trying to chronicle faculty effort and the diverse ways that gifted members of the faculty spend their time, we think has been demonstrably eased. Whether it will satisfy the auditors, and whether it will in fact prove less onerous, I think is an open question; but I think it's a myth, and a myth that is abroad in the land, that somehow that part, such a sensitive part, has been quickened, has been tightened up.

In the context of the A-21 Circular, the Department undertook an effort to fill in some of the ambiguities with an interpretive set of guidelines. We circulated drafts which met the expected round of suggestions for improvement. And we've had a series of really very productive discussions with the university community, represented through Tom Bartlett and the staff of the AAU; and there is absolutely no question that the final product of the Department's work in its interpretation benefited from the criticisms that came from the university community, and I think the university community felt that they were heard and that their concerns were given attention to; and we have had similar discussions more recently on developing an audit resolution policy in the Department, and the whole consideration of whether a longstanding dollar cap on indirect costs for training grants makes sense in the modern world.

So what I would manifest from the Department's point of view is a feeling that A-21 is a stride forward--an absolute willingness to test the proposition, indeed by going to individual universities--a feeling that individual universities vary widely in terms of their ability to report information and report it to the Government in ways that are responsive to A-21.

To pick up a theme that I gather my illustrious predecessor, Jim Kelly, whom I would like very much to have heard, emphasized in his remarks, there is a great desire to emphasize forward remedy rather than historic penalty, and indeed an organization within the Department, created within the last year-- an office in my own office, headed by Henry Kirschenmann-- to work with universities on precisely the long-term institutional changes and improvements and good-faith plans to put systems in place that will be responsible.

If we can get below the level of philosophical debate, we are talking, after all, about very, very substantial resources. I was stunned to see that the University of California received, two years ago, nearly a billion dollars in Federal grants and collected $77 million in indirect costs. So it's not a trivial expectation of the Congress, or any other body looking for accountability, to expect that both the university and the sponsoring agencies be able to explain both parts of that kind of equation; and while the amounts, in less expensive institutional settings are less, the principle, I think, holds.

Moreover, I just have to reflect, as the holder of the purse strings in a Department that seems to have a lot of money but rarely has it free when you need it, that these are tight times, and the notion of set-asides of large amounts of money from audits that are hanging open and unresolved for years at a time, which has been the pattern in HEW, is drawing, and I think rightfully drawing, intensified criticism from the Congress. In the context of that criticism and in the context, really, of increasingly understanding the obstacles to resolution, the Department is putting together right now a set of strengthened policies and raising the burden and the hierarchy for the responsibility for resolving these open questions to politically accountable officials, including for the largest and most intractable, the Under Secretary.

So there is a lot of movement in this area. We seek very much to approach it in the spirit of an absolutely open ear and a raised antenna for information, for knowledge of what is going on in the community we are working with. I, myself, have come out of an experience in universities and feel very much an awareness of the special characters of these institutions and the special character of the kind of work that goes on in them and the frigidity between the spirit of free inquiry and the presence of the overseer with the green eyeshade, and it is absolutely critical that that balance be kept in perspective. We are trying to do that. We are very anxious to learn more, and I personally regret, as I say, that this controversy on another front, but not irrelevantly concerned also with money, prevented me from learning more in your session today.

DR. FREDRICKSON: Thank you very much. Fred. Jim, you're going to be here tomorrow, aren't you?

MR. KELLY: Yes.

DR. FREDRICKSON: I think we'll begin with the Today Show rather than the 5:00 o'clock recap. If there are people who would like to specifically ask Fred a question or direct to him a comment or two, we can spend just a few minutes, because I really feel we must break up by around 5:20, 5:25 at the very latest. Leon Eisenberg?

DR. EISENBERG: I'm just curious, Mr. Bohen, how could the communication between the Department drawing up the circular and the university community have been so ineffectual that you are astonished by the distress? I mean, you might have decided, properly, to go ahead because it was right and we are all wrong, but I don't really quite understand why the distress comes as a surprise; and if so, I repeat what I said earlier in the discussion with Mr. Lordan, it would have been marvelous, really, if there had been some way to try it out in three places before it became the overall thing. We need some way of looking at the demand for efficacy as well as safety when accounting rules are changed.

MR. BOHEN: Well, first of all, let me say that the Department didn't draw up the circular; OMB did on behalf of the Government. The Department had an ample and extensive opportunity to make inputs into that, and in the process, which Mr. Champion can speak of today or tomorrow when he speaks more formally, it certainly received both from individual institutions and from the agencies that represent university institutions a lot of manifestations, as did the Office of the Science Advisor and OMB itself. Those, John--

correct me if I'm wrong, but that circular was not put out clandestinely in the middle of the night, but indeed after a long process of consultation; and I guess my sense is that all parties felt it was an improvement on the past and that we haven't had the kind of experience that would already lead to the suggestions, as I read them in the report of the Research Commission, that it is time already to go back to the drawing board for a new circular. I think we need some experience with the circular. I think the attitude of the Department, as the cognizant agency, and of OMB more generally on behalf of the Government, will be very much to build on the basis of experience and to try to find out from experience an approved operational context for this. But we are a year after the publishing of it and months ahead of operating under it, and somehow the anxiety seems to me to have outrun experience.

DR. FREDRICKSON: Dr. Brown and then Dr. Sherman.

DR. BROWN: There seems to be a lot of feeling that this accounting procedure is pretty stringent. I would like to ask either Mr. Lordan or Mr. Bohen whether they feel it would be possible to devise a system in which there would be an auditing procedure that would be adequate to catch the kinds of fraud and things of that kind which we now know to exist but which are surely quite rare, but not go to the extent of the present stringent procedures which may, in some cases, cost more to administer than the abuses which they in fact might catch.

MR. LORDAN: If we could separate first the accounting and auditing. They are quite different concepts. One is a matter of demonstrating that a cost has been incurred and it is properly assignable to some object--a Government research grant, for example. The other is the process of coming along later and checking up on whether that is the right assignment--whether in fact the documentation is reliable--and I'm not really sure from a lot of what we have heard this afternoon how much of the anxiety stems from each of those processes.

Our feeling is--and I think Mr. Bohen has said it quite well--our feeling is that the documentation requirements, the record-keeping, the accounting requirements that we put forth in the circular were a lessening of the burden. The burden that you may be anticipating from the audit followup is something we can't speak to yet because it hasn't happened. Certainly the Department and its Inspector General is going to be equally sensitive to the kinds of concerns that Fred has articulated here, and we expect that same kind of response from their colleagues in the other agencies; but of course we all have had bad experience with audit. OMB gets audited by the General Accounting Office, and we rail and complain about their process and their standards and the rest. It is never a comfortable process. I think we have to temper our anxiety, though, with the reality of what we've faced thus far, and thus far I don't think anybody has faced an audit test in connection with the new circular.

DR. FREDRICKSON: Fred, did you want to respond to that?

MR. BOHEN: I think it might be useful, and I would like to turn to my colleague, Henry Kirschenmann, who is closer to this. We're engaged in a certain amount of preventive health in this area in the Department by making visits to universities, working with the university people with respect to their accounting systems--even in advance of the activation of A-21 and any visits on the part of the auditing teams--to upgrade the systems. I think, Hank, it would be profitable to take a couple of minutes and give a kind of profile of what a typical visit is and what it has yielded so far in a representative case.

MR. KIRSCHENMANN: Okay. We've been doing this in two ways, both in our role of trying to settle audit reports that have existed now for some time--outstanding audit reports which have not been resolved--and also in trying to respond to institutions that have come to us with procedures and have asked us without audit whether or not they satisfied the requirements of the circular; and in both instances, our practice is to meet with the institutions, to understand their system, to agree on a system which meets the new standards, and to submit our best efforts to the audit agency--to the HEW Audit Agency, which is the cognizant audit agency.

The end result of that is an agreement between you and us and the Audit Agency that the system which we agree upon does indeed meet all the requirements of the circular and that its implementation will save the institution harm from, you know, someone coming in at some later time and saying, "Hey, I have a different interpretation than what you people have."

Now, we've dealt with, I guess at this point, some 40-odd institutions under the requirements for the old circular and about 15 or 20 institutions under the requirements for the new one, and we have agreements with 6 or 8 of those institutions, so it seems to me that we're moving.

One of the things that we keep referring to here, though, is this need for a rigidness and preciseness and great paperwork burden, and, you know, our experience today is that it's not needed. The circular is none of those things. It is not rigid. There is more than ample opportunity for the institution to institute alternative accounting procedures. It's not looking for preciseness.

It's looking for approximations, and the circular says that right now. We have always operated under that rubric, and I really question whether or not it is going to add to--going to cause a tremendous paperwork burden on the part of the institution. Certainly it seems to me, on the part of the effort-reporting of faculty it's going to reduce that burden and not add to it.

MR. KELLY: Hank, could I ask you a question about the six or eight where you have agreement--that you have looked at under the new: Do you find the application of the new circular significantly different in outcome from the old circular? That's the concern, and it seems to me if you visited that--

MR. KIRSCHENMANN: In terms of dollars?

MR. KELLY: Of dollars, yes.

MR. KIRSCHENMANN: We can't tell at this point. We're agreeing on procedural aspects. But I do think this: There has been--depending upon which side of the table you're sitting on, I guess you are going to either like or reject my observation--but there has been some concern by university administrators that the new circular was going to result in less reimbursement to them for overhead. I think that's not the case. I think if anything, the new circular is going to result in additional overhead recovery by the institutions if they choose to recover it.

MR. KELLY: You don't think, though, that that will vary from one institution to another? Let me just tell you that I have talked to institutions that have given me numbers very significant as to the loss in indirect cost recovery that they will experience under the new one. State University of New York did an analysis for me before I left in which they said that their recovery under the new circular would be greater than that which they had under the old.

MR. KIRSCHENMANN: I don't know whether that is true or not, frankly. I did see an article, and I forget whether it was in the "Chronicle of Higher Education" or somewhere, where someone had gone to a selected number of institutions after the circular was issued and asked them whether or not this was going to do untold damage to them, and as far as I know, Yale was the only institution that said they would suffer as a result--suffer in the sense that their rates were going to be less. I don't know of any other institution. My best guess is, my best feel for it is that it will not.

DR. FREDRICKSON: I'm going to let Henry Kirschenmann have the last word. It may be symbolically important to him. This has really been an extraordinarily valuable day. My office is about a five-minute's walk away, and you're all welcome to continue this conversation there for a while if you like. Tomorrow morning we'll begin at 8:45 in this room with Jim Kelly, who will give an overview. I want to thank all of you very much for your presentations today, and I do hope that as many of you as possible can get back tomorrow. The subject will still be A-21.

Thank you very much.

(Whereupon the meeting was recessed at 5:25 p.m., on May 13, 1980, to reconvene at 8:45 a.m. the following day.)

PARTICIPANTS
May 14, 1980

Donald S. Fredrickson, M.D. (Chairman)*
Joseph G. Perpich, M.D., J.D. (Executive Secretary)*
Francois M. Abboud, M.D.
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* Member of the Advisory Committee to the Director, NIH.

PROCEEDINGS

May 14, 1980

8:49 a.m.

DR. FREDRICKSON: Good morning. This second session of the Director's Advisory Committee will please come to order. I am pleased to welcome at least three new participants to the table today: Mr. Bill Carey, who is Executive Director of AAAS; Dr. Cornelius Pings, Vice Provost at Cal Tech; and Saunders MacLane, Vice President of the National Academy of Sciences.

This morning, as promised, particularly to those fixed at their television sets remote from us, Jim Kelly will take my overview time and describe what it is that he heard transpire yesterday. Jim?

MR. KELLY: Well, Don, I'm looking forward to it, and I'm anxious to find out what I say. I sort of elect not to try and summarize the presentations that were made yesterday--it seems to me that would only be useful to those who weren't here--but hopefully to distill out of the discussion some of the things that we identified, that we agreed to that look like they might be worthy of further study, and some of the elements that concern us but for which we don't have a sense of direction or resolution. I guess, Don, I think that you did the most profound job. You told us the two things--that, one, we should grapple with a difficult task, and, second, that we werent't going to arrive at a satisfactory conclusion at this session, and I think that that's been proved true.

It does seem to me that bringing together this group for this deliberation was established yesterday as being a very useful exercise. It isn't that we haven't had a lot of meetings over the years that dealt with the issue of what the cost of research is, and what the indirect cost component is, and what portion of it is properly the role of the Federal Government to fund. But all too frequently, such meetings are not multidisciplinary: the financial managers are meeting with each other, the university administrators are meeting with each other, the principal investigators are meeting with each other; and that the Government is meeting among itself and the university is meeting among itself; and it seems to me that what you have done is bring together pretty much a representative collection of all the various participants in this family, and it throws a somewhat greater light on the problem. I guess I would really like to start by saying that I believe it's possible that we've picked the wrong villain in the piece.

I think that we sort of set up this meeting with the idea that we were going to determine whether the new and revised A-21 constituted a threat to the research programs and activities and would impair a national objective, and I think there is substantial agreement among the audience that, yes, that is very likely to happen. This A-21 is going to give us all kinds of mischief and all kinds of trouble. But I'm not sure that we're focusing on the right issue at all.

I reread A-21, and with all due respect to all of the time-and-effort that went into its revision, I truly believe that the difference between this and the Blue Book that was developed by the Office of Naval Research in World War II is not significant, and in that 40-year period, we have done nothing more than tinker with the work the ONR did. I don't see anything so new and so novel in the new A-21, and I don't find it to be so materially different than the A-21 that we have been administering up until these revisions were made. I think some very radical and profound changes were considered, but in the final A-21 that was issued last March, I really don't find that any of those radical and profound changes have been adopted.

Let me tell you what I think has happened. I think that as the budget process has tightened--as we have become more committed to the concept of a balanced budget at every level of government--as the term "accountability" has become the bad word of the '80s--that we have increased our surveillance activities, that more audits have been conducted and greater concern has been expressed about audits that were conducted in earlier periods and remain on the desk as unresolved items, so that universities are hearing from the Federal Government about their noncompliance with the old Circular A-21; and they are being told that the systems that they've used for documenting and accounting for faculty and professional time is unsatisfactory and that they will have to adopt time-and-effort reporting.

The culmination of this impact on the institutions is causing the institutions to say, "You see what happened when they put out that new Circular. Boy, we're in trouble up to our ears because of that new A-21." And not a single one of those audits has a thing in the world to do with A-21. It is the fulfillment of the Circular that existed prior to last March and the terms and conditions of the arrangements with the Federal Government.

Now, I am not overly sympathetic with the way some of the audit findings were made; and a personal example of that was, as I told you yesteday, I helped create the Audit Agency, and so I should be proud of it; but I'll criticize it, because they came up to Stony Brook, and they had audited Stony Brook's research program five times, and each time they had the same payroll distribution system of faculty and professional time. The sixth time the auditors found that not to be an adequate method of documentation, and they had a further slip that went with it: They're supposed to give you the draft audit report for your comments, but prior to our receiving the draft audit report, we had a headline in the Long Island newspapers that looked like war had been declared, and in fact it had been. They said that $16 million of faculty time was not accounted for and improperly charged to the Federal Government. This was the total faculty time. It was not a concept that, you know, somebody might have overstated or understated. They just disallowed all of the faculty and professional time that had been charged to research programs. Well, you know, that's an unfair approach to it, and when we discussed yesterday the problem of credibility, and we indicated that Mr. Fountain had put out a report that disclosed the reasons for this concern on credibility, that whatever it was, $86 million of expenditures were questioned; and let me just say that $16 million was in that $86 million, and that we established our own lack of credibility. This partnership was not working when that was done. I think full disclosure is appropriate, but that, to my mind, is the kind of thing that's destructive of the system.

But nonetheless, I believe that the concern--now, I don't really know whether or not the new A-21 is going to make a significant difference or not. I have no reason to anticipate that it will make a significant difference. I think, though, that the focusing on the appropriateness of the new A-21 is focusing on the wrong issue. I think the issue is, What are the relationships under the old A-21? I just don't think the changes in this are that significant. I think the reason why we have such a high degree of concern on faculty is that we are being pressed back towards the utilization of time-and-effort reporting.

The time-and-effort reporting was required for years. I'm told that it has always been required, but I don't really believe that that's true. I have a distinct recollection of meeting with a group of medical school deans and the Association of American Medical Colleges dealing with that issue. I have a distinct recollection of, at their request, making a study that demonstrated that time-and-effort reporting was an inaccurate method, that it was merely the reciting again what had been recited in the original grant applications, and I am of the impression that HEW at that point in time stopped time-and- effort reporting and went to what is called a payroll distribution system, that that has recently been found inadequate, and that we've gone back to time-and-effort reporting. Now, don't misunderstand; some institutioins have always done it. Some institutions did it all before HEW ever asked them to be concerned.

I thought in yesterday's discussion we identified how unreliable time-and-effort reporting was. I don't know whether other administrators were as surprised as I was, but we heard several times about the people who filled out their application for funds, and presumably their time-and-effort report--not to identify how much of their time they spent on the project, but how much time would be considered a reasonable amount of time by a study section for that and constrain the amount of time shown to what a study section might think was a good idea; and if the purpose of time-and-effort reporting is to develop some reliable data on what the cost of the program is, that doesn't strike me as very reliable. As a matter of fact, I think that if you use the time-and-effort questionnaire as a means of collecting data on a research project, that every reviewer on that research project would say your data were no good because it was an unreliable instrument that you used and it had all the wrong incentives to responding to the questions--that it asked all the wrong questions.

But I think that the new A-21 has a very real promise to it. It suggests to any institution that doesn't like time -and-effort reporting that you can use a monitored workload system; and after the discussion I reread that section of A-21, and I might say that I think every one of us ought to give it a real trial--that the monitored workload system, it seems to me, doesn't place the kinds of burdens on the institution and on the faculty that we were complaining about. It doesn't require a certification of the preciseness of the allocation of time, but it requires a certification that the actual time that was devoted is reasonably related to the way the time was requested for support in the applications, and I just can't see that that could be burdensome to the institution. It should provide a reasonable documentation, and it should do away with much of the kinds of arguments and concerns.

One of the things that I thought came out in yesterday's meeting that I just would like to comment on: It seemed to me that--well, it has seemed to me over the years that one of the great virtues that you find in universities is the mutual respect among disciplines for the contribution that each of them makes to society and their ability to work together; but I just got a slight gleaning yesterday that that mutuality of respect for disciplines did not totally go to the university administration, to economists, to auditors, to accountants, and to public administrators that were referred to as bureaucrats; and I think that that mutuality of disrespect is a highly undesirable feature of our thought process--that it breeds an unnecessary and undesirable adversarial relationship; and I think that just as you asked those disciplines to be respectful of your discipline in the conduct of research, I think you must be respectful--that these people are people that are in a profession, that they are well-intentioned, and that they are of good will and are mutually trying to make their contribution to a society goal; and I think that establishing that certain of the disciplines are the villains and others the thieves is really not going to contribute to our solution.

Now, two things came out in yesterday's session that I found to be both interesting and rather astonishing. They deal with the extent to which there is a recognized volume of research costs that are not funded by research support. The two things that are interesting are, first, it demonstrates that the sophistication of the record-keeping system, the methods of allocation and control are much improved over what they were just a few years ago, because just a few years ago, you could not arrive at the cost and that portion which was reimbursed. So we really must have a lot better record-keeping and a lot better analysis of the problem now than we used to have to be able to say that the University of Washington has $9.2 million that it incurs in the support of research which is not reimbursed. Now, that's a pretty precise figure. In another institution it is stated that 18 percent of their costs are not recovered.

Well, it should assist us in establishing that the public funds used in support are not excessive, because there's evidence that the cost-sharing is real and significant and maybe excessive.

The second item that came out was that the concern between direct and indirect costs, although having somewhat different perspectives in the minds of different people in the audience, seemed to me to boil down to an issue of saying that one of the great problems we have in the support of an undertaking like this major one of research between the Federal Government and institutions is that inflation is having a tremendous impact, and that in order to proceed with our research and not impair the fundamental objective of our program, we need mechanisms that allow us to be responsive to the changes which inflation brings about in the conduct of our activities. What we found in this discussion was that the mechanism for adjusting to inflation and changed circumstances was much more responsive and much more flexible with respect to indirect costs than was the system for responding to inflation and change in the direct portion of the budget for the conduct of research; and it would seem to me that that is a fair criticism of the system--that if we had equally responsive and flexible abilities on both direct and indirect costs, it would be in our best interest.

I must say that I don't like to see us become so skilled in being able to respond to inflation that we don't find that what we really do is hate inflation. I just think that one of our great problems is that we are learning to live with inflation so well that we really aren't going to do anything to bring it to a halt, and nothing could be better for this enterprise than to bring inflation down to tolerable levels.

I thought another area that came out in the discussion yesterday that was worthy of consideration was the element of harrassment. It seemed to me that there was a great concern. A whole mess of things were identified--things that had happened with respect to Affirmative Action, with respect to OSHA, and 101 other things--the treatment of animals, the treatment of patients, the what-have-you that had imposed various kinds of new responsibilities on institutions; and cumulatively, they were having an adverse impact and effect on morale.

We seem to take the audit as the villain in the piece and maybe as sort of the last straw. But nonetheless, I think there's some fairness in establishing that we should so divise the mechanisms of monitoring as to minimize the extent of harrassment. However, I wouldn't go so far as to say that such monitoring arrangements shouldn't exist, because I think that, like the tax system, you really can't audit everybody in the system, but if you didn't audit anybody, you really wouldn't collect as much money. The volunteer system is sort of dependent upon the knowledge that there is a policeman there, and I think that in order to uncover the fraud and abuse and in order to promote economy and efficiency, that we need monitoring systems to tell us how well it's going.

If the monitoring is too infrequent, it also has a problem. If an audit is only made like once every five years, it identifies all kinds of problems that relate to administrators that are no longer on the scene. You are much better off to have it relate only to current circumstances. And if it's made too frequently, your feeling is that you're working for the purpose of the record, rather than for the purpose of conducting research, so that it does seem to me that we should be anxious that the frequency of reporting and the frequency of surveillance be related to some level of the tolerance in the system--that they don't become harrassment; and if there is any truth in the allegation that it has reached the point of harrassment, then I think we should very carefully review it to find out if that is a fair allegation.

The other thing that was discussed yesterday was the concept that perhaps you can modify the existing approach from a reimbursement concept to a grant-in-aid concept without materially changing the total resources that are allocated to this undertaking and without having changed the productivity of the enterprise and perhaps minimizing unnecessary work in furtherance of our objective; and that, it seems to me, is well worth exploring. Then last, let me just say that the very fact that we were called together and the reaction was the kind of reaction we had in this room yesterday seems to me to say that there is a sufficient amount of smoke in this problem to make you believe that it is hazardous to the health of the enterprise and it is worthy of exploration. If people feel this strongly about it, even if there is no substance to their concern, the program is being impaired because they believe that it's not being effectively administered, and they believe that the relationship between the granting agency and the execution agency has become adversarial rather than partnership, and therefore, it seems to me that it is very wise that we review it in that light.

The other area that came out of the same problem--we dealt with the area of the relationship of the Government to the institution and that interchange. Well, I thought it came out pretty loud and clear that you have some problems in identifying institutional attitudes--that having here presidents, deans, departmental chairmen, and principal investigators demonstrated that there isn't a high degree of mutuality in establishing institutional position. And part of that is the making of the Federal Government. There is no question that in the development of the National Institutes of Health, we paid tremendous respect to the individual faculty member--required his institution to sponsor his activities. Jim Shannon used to say that we had developed a system where the university was a motel, but Washington determined who was going to occupy what rooms, and there is an awful lot in that. And so our policies and our methods have caused part of the brittleness that exists between investigators and their institutions.

We were able in the discussion yesterday to move from indirect costs being a form of embezzlement to being a necessary cost, but obviously of less import than direct costs; and that, it seems to me, is a misunderstanding of what the whole concept of cost is all about, and we are in need of finding the ways that improve the relationships within institutions as well as those between the Federal Government and the institutions. I still think that we have a very worthy enterprise, and that we only need just a little bit of fiddling with it to further the truth.

DR. FREDRICKSON: Thanks very much, Jim. That was an excellent distillation of yesterday. Before we open it up to committee reaction, though, I would like to add a little more substrate to the mix. Yesterday we heard, toward the latter part of the afternoon, from several of the agencies. You will notice that the next portion of the program goes back to more of the actors from the side of university science, and to begin that discussion, I would like to ask Hale Champion to return. I naturally asked Hale to give a view from both sides of the fence, but in doing so created, or continued, that pernicious model that we are on different sides of the fence--which is a poor way to begin the solution.

Hale, welcome back, and give us your perspectives on accountability, if you will.

MR. CHAMPION: Thank you, Don.

Having been almost everywhere in this argument, I have a good deal of sympathy for all the participants, including myself. I probably deserve less sympathy; I didn't have to be here, because I'm not now directly involved.

I want to go back briefly just to sort of establish where I am, and there was a lot of loose talk about paternity and responsibility for various aspects of this thing yesterday, and I don't want anybody to be confused that I was either in at the creation or even started this last round. I did neither.

The first time I ever heard of this subject was when I was Director for Finance in the State of California, and I suddenly saw how much money was coming to the University of California, and I wanted some. So I came in from a typically different--I mean, from a very different point of view. I got some, too. The next time, I was at the University of Minnesota; and then I spent some time at Harvard, arguing and being occasionally furious at the behavior of auditors who, on one occasion-- I think perhaps my greatest explosion came when an auditor conceded to me that the way we were handling fringe benefits probably saved the Federal Government money, in fact undoubtedly saved the Federal Government money, but it wasn't according to a system he felt he could adequately fit into his concept of documentation, and that therefore we owed him $10 million. I said, "I'll see you in the Supreme Court." We didn't hear any more about it at the time. Some of the arguments that we had, however, didn't end in so happy a fashion, and I've been through those from the university side.

When I came to HEW, the process on this revision of A-21 had already begun. As a matter of fact, there had been drafts back and forth, and I talked to Hank Kirschenmann, among others, and to a lot of people at the universities; and at that time, those drafts were subject to a lot of criticisms from the universities and others; and we sat down and tried to arrive at some more satisfactory resolution of a number of the issues.

I don't want to spend too much time inside A-21 today, although I will come back and make a few comments. But my observation on those discussions is that if you take the premises of A-21, if you take that route, that those negotiations and those hagglings were generally among responsible people, each with real problems to solve, and each trying to do it in a reasonable, decent fashion; that the auditors have a real difficulty in terms of the demands of accountability. And I think there is a heightened demand for accountability--in many cases, a stupidly heightened demand for accountability. But the Congress hasn't yet gotten very sophisticated about that. They think numbers are easy to come by. The tend to believe numbers too easily, or to add up different numbers that appeal to their sense of where they are going and come to wrong conclusions from them; and a lot of the developing pressure for unaccountability has led us into some bad habits. I'll come back to that in a minute.

But inside the A-21, in this last discussion, the fact is that auditors have a very hard time with university accounting, with university procedures. They are very different, and very difficult. I think Jim Kelly was right yesterday when he said that some of the things they are asked to look at and say are documented are things that we all know can't be documented. There isn't the technology there to do it. But that doesn't ease the pressures on those auditors and the Congress or somebody else to go ahead and do it, whether it can be done or not. So they are looking for some certainty. They are looking for some ground on which they can act in a reasonably uniform and comprehensive way, and the fact that that's very difficult to do doesn't help their tempers or their dispositions any better than it helps those of the people that they have to deal with, and universities are not notoriously sympathetic to other people's problems. I think I spent enough time inside to know that. They are even not very sympathetic to each other's problems, as between the faculty and the administration, as Jim noted earlier.

But I think everybody in this process was trying to do what they could. I think the fundamental problem lies in the A-21 approach. I'm not sure I understood what Jim was saying yesterday about a wrong turn in the road. I almost brought down a young faculty member of the business school who has put together a new set of cases, which you could, if you wanted to, give the loose name "You show me the regulation, and I'll show you how to beat it," in terms of how this thing goes back and forth in negotiation; and I'm afraid that any system that depends basically on costing what somebody else does is going to be subject to that kind of problem.

I must confess that while I was at HEW, I spent a lot more time worrying about Medicaid than I did about A-21, but the same problem of costing and reimbursement are very clear in that government relationship.

Let me for a minute, then, go back outside A-21 and talk about some things that I think could reduce the heat, the pressure, the concern that is making this internal argument difficult. There isn't anything I can do about poverty--about what the national resource allocation is going to be. There are some things you may be able to do about it, but I suspect not very much at this point. That's one of the things Warren Bennis said yesterday: "Poverty doesn't improve character." And it also doesn't improve rationality, and we all feel the pressure, and we are all trying to find some way in which it can affect us a little less and affect somebody else more.

As long as we've got this problem, it seems to me that the first thing that ought to be established here is something that I think everybody involved in the argument believes, and that is that however much research the Federal Government chooses to support, it is very clear that university-based research is the cheapest, highest-quality, and has the best by-product--that is, the trained manpower for the next generation of research--and that we haven't done nearly enough talking about that and establishing that fundamental fact. If we establish that fundamental fact--and I think there's a lot that Government and the institutions could do to establish it--then I think you could ease a lot of Congressional (it seems to be more Congressional than a generalized public) concern about this--that if you've got the best and cheapest product, that what goes on in the internal pricing is of somewhat less consequence to the Congress in its oversight of how the Government spends its money. Then, if we look more toward outcomes and less toward process, and if we talk more about the outcomes and less about the process, at least as we discuss these matters in public, then we're all going to have less trouble; and I would commend that to you. I will come back to some specifics on that subject in a minute.

I don't think it's too difficult to establish that. I think the last time there was an effort to establish it, we made a mistake: We turned it over to the accounting firms. They went back in and started doing a detailed accounting, and really the outcomes here are not fundamentally accounting and auditing outcomes, and we really ought to look at it in a larger way and make that case and talk more loudly and more publicly about that than we do about our internal arguments over costing formulas in A-21; and I think that the assistance in obtaining credibility for this can come from the Government and its agencies--that NIH can play a major role here, can help the universities establish that this is an agreement between the universities and the Federal Government. And if there are some people who dispute it in the Defense contracting business or in some of the nonprofit institutes, let them try to make their case, but I don't think they can. If you're already the lowest price, then you're not a rip-off, automatically. I think we ought to keep that in mind.

There is a second thing that I would press (and while I have sympathy with everybody, you will see that I have criticisms of everybody, too, to match). I do think the Federal Government is in part responsible for its own problems, that the auditors are in fact responsible for their own problem. Jim touched on that this morning. And I used to have these arguments with the Inspector General at HEW.

The way we report auditing and accounting in the Federal Government, or lend ourselves to Congressional reports of this, is absolutely scandalous. These huge sums of money, whether it's Jim's $16 million or somebody else's, we want auditors to raise every question that they see. That's what auditors are for. But if every question that they raise is to be identified and translated somehow into fraud or rip-off or the university is trying to do something wrong, then the discussion we're having here today is in great trouble. And there have been lots of reports out of the Government over the years and lots of those war-declaring headlines that are terribly embarrassing for institutions, and in fact are just plain unfair, don't relate to fact, don't relate to what any responsible auditor or accountant would do.

A lot of the responsible officials don't know enough about their own audit processes or about what goes on in there to be able to classify that which is truly a potential fraud and that which is lack of documentation for what may well be justifiable. But those numbers out front are horrendous. If we never had any numbers in this business except those of proven fraud, or had only raised questions about things that people really did wrong--and people do do some things that are really wrong--we wouldn't have a lot of the problem we have. Those are not the numbers that come into the Congressional debate, and I think the Government can reform its own handling of these numbers, to be very careful and very specific, and not give in to Congressional pressure to make a problem seem bigger than it really is, which I'm afraid has happened in the past.

I think it would also help--and now I'm addressing myself to the university investigator-- if they would admit that things costed indirectly are just as important to research and cost as things costed directly, and that it doesn't solve anything to try to separate those and set up an internal kind of conflict. What that does, I'm afraid, and I think we have some evidence that it's going on, is that first they start by taking it out on their own institutions, and as Henry Meadow said to me yesterday afternoon, "Sick chickens don't lay very many eggs." And the institutions, in self-defense, then pass it onto the Government, and we're involved in one of these public arguments, which makes it look like none of us knows what we're doing. I suggest that that isn't a very productive discussion--that what we get into then is, you know, blaming one anther and making it appear to people outside the process that, in fact, somebody is doing something wrong and we'll get to the bottom of this no matter how long it takes us, and that ends up costing everybody. It ends up costing the total allocated resource--allocation to research funds, however they are divided--as well as imposing ever greater accountability demands and requirements.

I now have to plunge into A-21, I guess--reluctant as I am to do so--to say that it leads to ever more pressure on this time-and-effort thing, which most of us know is one of two kinds of nonsense: rational, carefully thought out nonsense, or just plain, made-up nonsense. It is nonetheless very close to nonsense no matter how you do it, and we all know it. The very process of research tells all of us that; and no matter how we may try to figure out some other way of saying it, I at least will never be convinced that it's anything but a form of higher nonsense.

Since I don't know a cost system that really works in this area, I'm suggesting that we try to find a different way, of the kinds that were suggested yesterday. Nothing practical is going to be done about the new version of A-21 until we get a little more experience. I think that's coming out. Maybe some of Leon's experiments can be tried while we're working through that, but that's what we are going to have for a while, and we can talk a little bit about that. But I really think we should be thinking at the same time about whether that was a wrong fork in the road, and whether some form of grant-in-aid--some other approach to this that doesn't get into a costing thing (which is always going to be subject to criticism by anybody looking at it) shouldn't be tried. Because no matter how we refine it and how we play with it, it's always going to be a little bit that way; and since university research is, I think, the cheapest and best, you can negotiate some fixed cost--though I wouldn't venture to say how much attention you have to pay to history in justifying those costs, in arriving at that kind of formula.

But I'd like to get back to the time spans involved here, particularly in an inflationary period. They are such that we've either got a constant audit process and a constant rolling readjustment process, or you've got somebody taking a beating because of the rate of inflation. We need to arrive at some up-front fixed costs. And we ought to be careful about what we do about some kinds of indexing, or some side relationships that result in cost changes over the time period. Are we arguing over events of five or six years ago or just trying to settle a simple change in audit procedures?

I remember one time at Harvard I volunteered to save the Federal Government some money, in effect saying, "I don't think we costed this right and we ought to change the rate in this respect"; and when they recovered from their astonishment, which took them about 30 seconds, they said, "Yes, and for the last six years, right?"

(Laughter.)

MR. CHAMPION: I didn't learn in the Army not to volunteer; I learned it in the universities in dealing with the Government. And that's another one of those things we can get out of if we're not on the direct reimbursement basis, with all of those problems.

There are some other possible things to look at to ease the relationship, most of which have been discussed and of which the people in this room, who have spent the most time on it, are aware. But let me just mention them to get them back into the conversation.

One is--I think there's merit in the notion, after what's happened, of the use of nonadversarial auditors by the universities. Private universities already have auditors who come in and do the thing. They've got their acceptable accounting practices and certification, and they can deal with this fraud problem and they can deal with a number of others, and since they have to go through the books every year anyway, fine. Now, it's a different problem for some public institutions, but I think it's one in which you could arrive at some reasonable procedure. If you could combine it with monitoring workload or some kind of sampling process, which again they could certify, I think we could get out of a lot of the most difficult burden on faculty time-and-effort reporting--and, as a matter of fact, time-and-effort reporting involving other things, like how you handle space, and how you handle all the things that don't subdivide very easily or very readily.

I would like to suggest--simply because I would like to suggest it, not because I have any hope--that another place where everybody went down the wrong road (and if we could ever just forget about it, just drop it in the ocean when nobody was looking) is the whole set of cost-sharing arguments. They complicate everything, they make no sense, they are a ridiculous collection of ploy and counterploy, and they further complicate an already impossible set of costing problems.

I think I would close simply by saying-- and I am going to leave it to a lot of people to think about these solutions-- that I do think NIH is a very promising place, as against some of the places where some of these discussions have taken place in the past, to try to get all of the players into it and to try to consider these other things outside A-21--to try to get some agreement about them, and before the next A-21 crisis comes up, to really be in the process of developing something on which everyone doesn't feel defensive and uncertain, because fundamentally what goes on inside A-21 is by its very nature going to create defensiveness because everybody has to be a little bit wrong and uncertain because nobody really knows. Thank you.

DR. FREDRICKSON: Thank you very much, Hale. Bill Carey has been around Washington a long time, writing, speaking about some of these problems, and we are glad to offer him a chance at the podium.

MR. CAREY: Well, I won't keep you long. I think you've been hearing a lot of speeches, and they're all good, and I'll be very brief. I must say that as I came in this morning, I noticed that in this very elegant and almost too technological room, there were two signs. Ons said "No Smoking"--several signs--and the other said not to bring coffee into the room. I've been intimidated, and I haven't lit my pipe, but I counted ten coffee cups, and I think life is very unfair.

(Laughter.)

MR. CAREY: If you come down to AAAS, I'll let you smoke and bring in your coffee. Well, I think there is a malaise in the Government/university relationship. I've listened to--I must say, I was delighted to hear--Jim Kelly this morning. Jim and I used to barter and bargain and battle over the HEW budgets, legislative programs--back when life seemed simpler, at least from this distance--and I think Jim hasn't lost a step, and I'm delighted--not that I necessarily agree any more with him now than I did then, but he's a great fellow.

But I do think that there is a malaise in the Government/university research relationship, and I don't think it has anything really to do with any broad disillusionment with the usefulness of science. I think that is very important to nail down. I can certainly detect no attitudes in or out of Government that indicate a change of mind about the values of science or research. I think as far as the general public interest in science is concerned, it's high, and it's growing, and I can prove it if pressed.

So the problem has to lie somewhere else, and of course it does. I think that when Government bears down on the universities, the research universities, it's doing this because it's a reflection of the heat that's being generated broadly--not against science, not against research, and not against universities, but dissatisfactions generally with the government's performance by the demands for disclosure and cost accountability, the sacred word, resistence to high taxes and the cost of Government; and when you come to a system of supporting research which is tied to what is called a "granting mechanism," that system becomes somewhat victimized by this general public psychology, because a grant sounds very much like it's a gift; a contribution, a subsidy, a giveaway when times are tight; and everybody is heard, and although Government knows better, it tends to reflect this heat off itself, away from itself and onto the research universities, by inventing a defense mechanism and the systems we've been talking about here. I think these are some of the realities.

I don't think it's hard to see where the universities find themselves in this kind of environment. They are hostages to what was originally meant to be a partnership, but which has tilted more and more toward becoming an administered relationship; and I think the universities are going to remain hostages for some time, because I think they've made the mistake over the years of giving up most of their negotiating authority, and so government holds most of the cards.

Now, I think we have to hope that on the Government side thoughtful people will come to realize, and I think they're coming to realize--that the administered relationship has by now captured most of the benefits that were there for it to capture, and that from now on it's going to be accumulating some costs. I think this realization will come slowly. The tendency will be to struggle for yet another increment of administrative benefit, even though each added increment comes at a higher price.

Once an administered relationship gets off and running, it builds an energy and a momentum of its own, and I think one can say that administration was an endless frontier before science got there. I can say those things as an administrator who, like Jim and Hale and others here, are entitled to wear a black belt. I know very well what it's like to be on the administrative side. I was in the Budget Bureau, after all, for 26 years. It's the feeling-- It's very interesting: You have a sense that you're in an embassy, and outside the pressure groups and the clientele are all howling for justice and asking to be fed, and there's only so much food and there's only so much, apparently, justice, and your problem is to mete it out, and one finds it very difficult, indeed, to manage resources and to do it in systems that have some equity and fairness and mutual respect.

In Government, I think there has always been a tension between administration and program substance. I suspect strongly that that same tension exists, if not more so, in the universities. The contradiction is there. The knowledge process is open-ended, and administration is uncomfortable with what is open-ended. That contradiction, I think, is the source of much of the trouble that's been recited here (--apparently; I wasn't here yesterday).

I think administrators properly seek the improvement, the perfectability of their system. If they have any pride, they do. Scientists seek excellence and scientific freedom, and the two sides approach the terms of the government-cum-university relationship from somewhat different starting points and expectations. I think I can say that Government invests in science and research to produce a value--a value, by the way, whose properties are very hard to measure and very hard to store as a realized asset, and so Government resorts to surrogate systems designed to protect its investment while it justifies that investment. It is very hard to do otherwise.

The universities, as I see it, pursue science as a discovery process and as a component of education, and they idealize the state as an enabling agent; and I think, if the truth is told, for a brief time in our post-war history, the state itself had that view of its function. It didn't last.

So I think we are left with two views of the same world, and the problem is to reconcile them within an imperfect working arrangement. I have a hunch that it is this perspective that has become lost in the controversy. I happen to think, as one who had a hand in the post-war architecture of the relationship, that Government has overstepped its role and that the quality of the relationship has been decaying, but I also believe the Government has a right to be sure that the scientific research that it sponsors in universities is performed conscientiously and with best efforts. It ought to be able to make that finding. But I believe that the proper mechanism for making it is the research audit, if you will, and not administrative proxies that don't reach those findings.

The question of whether money has been used as intended is also legitimate, but the problem to me is that this seems to be the whole question rather than incidental to the more important and the more significant question: How good is the science?

The burden, I think, rests on the universities to show, to demonstrate that administrative zeal is imposing barriers to excellent research. Now, until I came in here, I had been believing intuitively that over the past decade, the combined effects of inflation and especially red tape regulation, had reduced the productivity of university researchers by about a third--just a kind of intuitive hunch on my part--and I've been a little shaken in that conviction, because I was reading in the material that Don's people sent to me before I came here what Marty Meyerson had been saying, and Marty told you that out of his total university budget of $400 million, something like $4 million goes toward meeting Federal paperwork requirements. Now, that's a lot of money, but are you persuaded that life is intolerable when one percent of the university budget is the sum of the burden? A data point like that sticks in my mind. For myself, I would be much more interested in seeing indicators of the displacement of intellectual, experimental, and teaching effort because of Federal paper work and procedural routines. I think we've got to start asking a different question.

Now, as one very modest and back-bench member of the National Commission on Research, I must say that I felt very strongly the absense of documented analysis of the accountability burden. You will be hearing from Neal and Linda shortly, but we just couldn't find that information, and so we did what we could without it. As I look back over a two-year exerience that is coming to an end now on that Commission, I think perhaps the best thing we did was to talk very openly, very widely, and with our shoes off with Government administrators, and we found them, I think I can say, invariably sensitive to the issues that were on the table and very much troubled by it, and they pressed us very hard for specifics and for evidence, and we had a very hard time giving it to them; and I think that this wonderful reasonableness on the part of Government administrators has its consolations, but it's not likely to change a paragraph in A-21. Nothing is going to change the rules until we can document the costs to science, the excellence of science, the productivity of science, of an overadministered partnership in terms of reduced productivity and arrested incentive; and when we can do that, I think we can turn things around. Thank you very much.

DR. FREDRICKSON: Thank you, Bill. Is there discussion from the table or comment on any of the perspectives that have been provided? If not, I can offer you another perspective that hasn't yet been heard from. I am reminded that we've heard from every aspect of the university except a flesh and blood comptroller, and there is one here from Duke University who would like to speak very briefly from the vantage point of his unprotected position. Mr. Peyton Fuller, would you like to say a few words?

MR. FULLER: Yes, thank you. Most of the discussion yesterday centered on the time-and-effort reporting of faculty. That's not a subject I want to speak about. I think there are a few other aspects of A-21 that also deserve attention.

I might say that I do agree with Mr. Kelly that the possibility of the monitored workload does appear to me to offer considerable opportunity for improvement in this area, if both the universities and the auditors will allow it to be tried and to work. I am disappointed that more universities are not opting for that. At Duke we're going to give it a try, and we're going to make our sincere best efforts to make it work. To make it work, however, is going to require two things: It's going to need the cooperation of the faculty and the administration on the one hand, and it's also going to need the understanding and sympathy of Federal auditors. If Federal auditors approach the monitored workload routine with the expectation that it's going to provide absolute precision and finite allocation of time, they're obviously going to be disappointed. It will not do that. I think it can and should provide a reasonable apportionment, a fair apportionment, but it's not going to provide absolute precision; and I'm afraid many universities are reluctant to go to it out of the fear that the auditor's expectation of it are going to be beyond their abilities to achieve. We're going to give it our best effort, because I would agree, as I said, with Mr. Kelly: I think it does have the potential of alleviating some of the frustration that our faculty members have experienced in the past. I hope it will work.

I would like to, however, make a few remarks about several implications that were raised during the discussions yesterday-- that the new Circular A-21 will not reduce overhead recoveries of many, if any, universities, and that in some cases the actual overhead recovery may even be greater than in the past. I'm afraid that assumption is overly optimistic. Our analysis, and that of many other similar universities, indicates that it's almost a mathematical certainty that any institution which now has an overhead rate that realistically reflects its overhead expenses will be penalized by the new A-21. The only remaining question is, How much will that penalty be?

The primary reason for this really has nothing to do with effort reports or monitored workloads, but rather with the basic allocation philosophies that are espoused in the new A-21 when compared with its predecessor documents. The previous A-21 generally discussed cost-allocation techniques for the various indirect cost pools in very general terms, and allowed individual institutions considerable latitude in developing specific allocation techniques that they believed would fairly and equitably allocate these costs among the functional activities of their institution. So long as these various allocation techniques were used consistently and uniformly, the Government auditors seldom challenged them, and when they did, the burden of proof was on the auditor to demonstrate that such allocation techniques were not fair or reasonable.

In this connection, it should be noted that cost-allocation techniques are not a precise science. They are far more of an art form. There is a very wide gray area into which many cost-allocation technique can fall. None of them can accurately be described as either right or wrong. One must make value judgments as to their relative value and must balance off the worth of an apparent increase in precision against the cost of accumulating the various statistics that are needed to implement the allocation technique.

For some reason, the writers of the new A-21 decided that there was something inherently wrong with this flexibility and diversity that resulted from the previous A-21. There now appears to be some inherent virtue in uniformity and standardization. To achieve this uniformity, the new A-21 describes very specific and precise allocation techniques for almost every cost pool.

Now, it may be coincidence, but we find it interesting that in almost every case these new allocation techniques that are prescribed will probably result in reduced allocations to the research function over what would have previously been used in many cases. To compound this problem, the new A-21's only acknowledgement of the possible propriety of other allocation techniques is to indicate that such techniques may be used if the institution can prove that the proposed alternative is more equitable. The burden of proof has been shifted from the auditor to the institution. The institution is not assumed to be innocent until proven guilty, but rather presumed to be guilty until proven innocent.

Furthermore, we would guess that for an alternative allocation technique to be considered acceptable, the proof will have to be an indication that the alternate allocation results in even less overhead being charged to the assigned research function. We don't believe--nor do many, if any, other universities--that we have to wait for an audit to substantiate this assumption. In our opinion, the handwriting on the wall is very clear, and it carries the title "Circular A-21."

Another statement made several times during yesterday's discussion also deserves a few comments. That is the statement that it's the specific objective of the Government to pay its full fair share of both the direct and indirect costs associated with research and training activities which it sponsors. I am sure that every university would agree with that objective. Unfortunately, the trouble is that while this may be the Government's objective, it is all too often not the practice of many Governmental agencies. For example, no Government program, other than Medicare, will allow interest expense incurred by an institution in debt-financed acquisition of capital equipment to be treated as an allowable expense, no matter how essential the acquisition of that capital asset was to the sponsored research or training activity. Similarly, if the institution had funds of its own that it could use to finance such capital acquisition, no recognition is given to the loss of investment income potential suffered when it uses its own funds for such an acquisition. Since a nonprofit institution cannot make a profit, it should at least be provided a return on its invested equity, or if even that is totally unacceptable, consideration should be given to allowing the annual depreciation or use-allowance to be adjusted upward to recognize the replacement cost value of an asset rather than its original acquisition cost.

Another conspicuous example is the arbitrary limitation on overhead on training grants to 8 percent, regardless of what the actual rate is calculated to be, even when you do it precisely as prescribed by A-21.

Finally, there is the very serious problem of inconsistency among Governmental agencies. I would admit, to give credit where credit it due, that HEW probably comes closer to approaching fairness in its treatment of overhead recoveries than does any other agency within the Government. But what is unfortunate is that other agencies steadfastly refuse to follow HEW's lead, and there appears to be little ability on the part of the Government to achieve standardization, even within its own confines.

What we wish is that more attention could be given to these types of problems and that a truly bilateral dialogue could be developed, with the Government and the educational institutions working as equally interested parties and not as adversaries or antagonists towards the mutually beneficial solution of such problems. Thank you.

DR. FREDRICKSON: Thank you, Mr. Fuller. Dr. Eisenberg?

DR. EISENBERG: One of the things that this morning's discussion, I think, made even more evident than was apparent yesterday is that we--from the university side, and I hope I can use "we" to speak of administration as well as faculty, but we have to work that out--need to have some way to engage the auditor function and the philosophy behind it before the $16 million disallowment appears in the Long Island News.

We have to somehow get into the public debate and the debate with Congress--and that's where I'm not quite sure how to engage it--the notion that auditing principles lead to eternal truths no more frequently than scientific research does.

(Laughter.)

And in fact, what we need to bring to the attention of the public is that some years ago somebody either made up or reported a conversation between three major league umpires which I can carry back to the example that was used yesterday. It is alleged that Madgerkirf, Clem, and MacGruder were discussing the principles of umpiring, and the first one said, "I calls them as I sees them." And the second sneered at him and said, "I calls them as they are." And the third looked at the other two with contempt and said, "They ain't nothin', until I calls them."

(Laughter.)

I would commend to your attention the fact that aside from fraud, gross fraud, in auditing, "They ain't nothin'" until somebody decides the rules by which they're to be called, balls or strikes, and that until we engage that kind of dispute, we go on fighting from the position that somebody says we cheated, when in fact it wasn't cheating at all, but a different method of deciding what the strike zone is.

DR. FREDRICKSON: Sartre is dead, but Eisenberg lives on. I think it's time we turn now to an opportunity to hear a report on the National Commission on Research. Dr. Pings and Dr. Wilson, you've got about half an hour. I don't know how you want to divide it, but we'll leave that decision to you.

DR. PINGS: We think we've worked that out.

DR. FREDRICKSON: All right. Dr. Cornelius Pings?

DR. PINGS: I am going to share this half hour with you in reporting on the National Commission on Research with Dr. Linda Wilson, who has been a most valued member of that endeavor, as well as has been Bill Carey, who spoke to you earlier. That great American philosopher Casey Stengal has been quoted once already this morning, and as I look at the large and diverse audience that this subject has attracted, I was reminded of one of his other bits of wisdom. Referring to some ongoing gathering, he said, "Nobody goes there anymore because it's too crowded." So I was glad to see this was crowded this morning.

I have been making appearances in several places in this community and elsewhere around the country, describing the activities and, as they've emerged, some of the conclusions and findings of the National Commission on Research; and I usually have to start, of course, by laying down some background rationale and the premises. I think, in view of your activities yesterday and the speakers who have preceded me to the podium this morning, I can take as given for this audience the problem. There is a basically very sound and very important relationship between the Federal Government, representing the society as a provider of funds to carry out research in the national interest, and the universities, which have an immensely important role in carrying out that research, particularly in the basic area.

But there has been a concern, manifested by indicators expressed here today and yesterday, that something is wrong with that relationship. Not only is it bad, it's getting worse. Incidentally, our Commission is not an advocacy group for enhanced funding; rather, we are taking the position that those funding levels are established annually, or in whatever cycle, by a political process; and whatever the outcome of that process, the issue of whether too much of a limited resource is going into administration is becoming increasingly acrimonious.

I was not in on the founding of the National Commission on Research. It was brought into being by a group of six scientific and educational associations, and that discussion started essentially two years ago, approximately. The associations involved were the AAU, the ACE, the National Academy of Sciences, the Land Grant Association, the Social Science Research Council, and the American Council of Learned Societies.

Although that is the parentage, the Commission, once established, has been independent. We don't report back, and we're not reporting back to those founding associations. We're reporting to the broad constituencies--to anybody that will listen to us.

We've had to have funding, and that has come from a half-dozen private foundations and from, in small amounts, three Government agencies: The National Science Foundation, the Department of Energy, and the Department of Defense.

I will omit some of the details about the Commission's membership and background because I see that you have a copy of our first report in your booklet, under Tab H, and that lists the roster of the contributing members and gives an historical sketch. I do want to say about the membership, however, that it's drawn significantly from the university community. Eight of the 13 members are practicing scientists or scholars and/or administrators. There are three from what I would generally call the public sector, including Charles Mosier, former Congressman from Ohio; and there are two representatives from industry. I have fallen into the trap of using the word "representative." We really, none of us, are representatives. We are there as individuals, hopefully representing backgrounds that are diverse and, we hope, have the experience to get the problem at least defined.

We thought at one time that we may not be able to go much further than that definition. As Bill Carey indicated, it has been immensely hard to gather hard evidence, but we went about it the best we could. We appointed a small staff and opened an office here in Washington, and the Commission has met once a month in full meeting, usually here in Washington, but not always. We have tried to work in a highly interactive mode, particularly in terms of consultation with Government officials that are involved. We not only have called them as witnesses before our Commission and solicited their help in obtaining all documentation and the results of previous studies, but we have gone repeatedly to individual members of the Commission and subgroups to solicit their viewpoint and their help and assistance.

The Commission, as I described the membership to you, doesn't have active members from the Government sector--in view of which we did designate a liaison group from all of the major program and regulatory agencies, and we've had particular help from Bill Raub in that regard. And I must say that the most pleasant surprise to me, as an outsider to this community, was the open-arm welcome that we received from all sectors of the government as we went around to try to establish the nature of the problem and seek some solutions. Basically, our reception was, "Where have you been? It's long overdue" and "It's our problem in a comprehensive sense." Perhaps that's the most optimistic thing I can report to you.

We have organized ourselves into five subject areas, appointed subcommittees to prepare initial drafts for Commission consideration, and will issue reports in those five areas. There will be two more forthcoming within two weeks. The next one will be on alternative funding mechanisms. A third will be on quality assurance and review processes, including the peer review process; and the last two reports, which we anticipate we will publish in the third week in July, will be on research personnel and university/industry/Government relations.

Incidentally, the Commission will go out of business on the 30th of June of this year, and that is definite. From what I can see now, we will finish our tasks on time and within budget. That's partly because we've defined it that way.

I described to you our interaction with individuals and groups in Washington. We also moved ourselves to get out of this community and into the field. We took the entire Commission for full meetings on the Madison campus, the Cal Tech campus, the Stanford campus, and also held full meeting at the time of the AAAS meeting in San Francisco last January. In all those instances, we called designated witnesses who we knew to be experts; but in addition, in all events, we had given prior notice that we were meeting at open sessions and let all that were concerned, principal investigators, administrators, and whoever wanted to to talk to us. Additionally, we've held subcommittee meetings at the University of Alabama in Birmingham, and in Salt Lake City with the Intermountain Research Universities.

I described the process because, repeating again Bill Carey's observations, hard evidence has been hard to develop. We have had to gain as much information as we could be listening to people. We reached the conclusion finally that to make an absolutely definitive case on any of these points would take very long, and that perhaps 90 percent of the wisdom that we could generate might be at hand based on what we knew, what we heard, and what we gathered; so with some trepidation, we've plunged ahead to put out reports which describe, we hope, the situation, and we probably do that better than we do provide solutions.

I am going to leave to Dr. Wilson to go through some of our recommendations, with particular emphasis on our accountability report, which you already have. I want to make two parting comments though, before I turn it over to her. One is the relevance of this study to the A-21 topic, which has been much before you yesterday and today. My personal conviction--I don't want to speak necessarily for the Commission in this regard--is that A-21 is not a problem; it is a symptom. I think it is a symptom of a whole collection of problems that we've tried to deal with in our Commission study. I want to remind you--I gather this has been said--that the A-21 document is not all bad from the university point of view; but it does present a number of difficulties, the least of which is effort-reporting, which we've heard about--difficulties over cost transfers, difficulties in a few campuses over the forced change in the nature of tuition remission.

We believe that the process of developing A-21 basically was not sound. As Mr. Kelly alluded to before, it is some sort of a linear, patched-up extrapolation of the Blue Book from World War II days; and in our Commission report, we call for a revision of A-21, but not by a further patchwork process. Basically, we think there's a need for a new approach which would identify some of the fundamental needs and objectives of both sides of the university community and the Federal Government in these matters and would try to evolve a set of cost principles and accounting rules that are compatible with the nature of the research process and its funding on our campuses.

As I said, I am going to ask Dr. Wilson to summarize the major conclusions of our report, but I am going to take the privilege, Linda, since I got up here before you did, of usurping one of these, because I think it sets a tone that pervades all of our Commission activities--not only the accountability report, but several others--and I think maybe cuts across the lines of what you have been discussing here today. It is our recommendation 11, and I think we are saying here something that Mr. Champion was saying in slightly different words a few minutes ago.

The Commission recommends that Congress, the agencies, and the universities assure that the processes of accountability themselves meet the tests of accountability.

The processes should yield results which justify their cost. With that I will call upon Dr. Wilson.

DR. WILSON: It has been very interesting to sit here for these two days listening to all of this discussion, because in many ways it repeats a lot of the long and vigorous debates we had in the Commission meetings themselves, both with individuals from the Government, individuals from the universities, and Commission members as well. It is hard for me to keep my hats separate. I function as a university administrator in my home institution. I have tremendous sympathy with the faculty viewpoint, having been a faculty member. At the moment, I am trying to wear my Commission hat, and I think that I can identify when I stray off of that path.

In working on the accountability issue, one of the first things that we studied and reaffirmed for ourselves was the major purpose of the Government's support for research, something which I think we lose sight of from time to time; but the research that is performed by the universities and supportd by the Government is done because it is in the public interest to do so. There is a confluence of purposes between what the Government is trying to support and what the universities are trying to do; but those are not identical purposes, and I am afraid that many of us lose track of that very early in the game. The university and the Government share some important characteristics. They are highly complex institutions, they are evolving, they are diverse, they have limited resources, they have goals of their own that are in conflict, the leadership in each has a variety of views on the proper relationship between the Government and the universities, both induce and respond to changing social expectations; but there are very deeply routed institutional differences between the Government and the universities--and let me stop right there to say that it's improper to speak of "the universities," because they are by no means of one mind, even within themselves, nor is it proper to speak of "the Government." On the other hand, one has to speak, and so we will proceed this morning to lump them together, recognizing that they're not of one mind.

These deeply routed institutional differences have been contributing to a gradual deterioration in the relationship between them. A central issue in this has been accountability. The main themes of this disagreement are these: The problem for the public is to assure that the best research is produced and that public funds are not wasted. The problem for the Government is to obtain fully its program purposes and to fulfill its stewardship responsibilities. The problem for the universities is to conduct research well, to avoid diversion of resources to meet unnecessary administrative requirements, to protect the integrity of the university's own operations. Both the

Government and the universities seek to maintain public confidence. Without public confidence, neither can do the other things that are their missions.

There are some specific issues for each side of this relationship. For the Government, the main issues seem to be stewardship, the fact that they are often criticized for intervention within the workings of the organizations that they support, resource allocations to the extent that they are criticized for their stewardship or for their intervention, resource allocations withheld: that is, the Congress, the public will not support enough resources to fulfill the Government programs. They are worried about diversion of resources, especially diversion of the use of Federal funds for unintended purposes, and they worry about public confidence to a great extent, and that is a proper concern.

For universities, they are worried about the criticism of their management, and particularly about the failure of many on the outside of the universities to understand that management is different within universities and properly so. They worry about the reduction of research because of diversion of funds to administrative requirements and because of reduction in flexibility and because of reduction of resources for research. They worry about reduction in public confidence.

There is no issue between them about the need for accountability for the use of public funds. The only question is how to render that accountability. The system of accountability, a proper one, must involve an appropriate balance between independence and control, between incentives and constraints, and between the costs and benefits of various procedures and requirements used. Unfortunately, the system of accountability that we now have focuses primarily on constraints, primarily on costs, and primarily on requirements and controls.

Now, there are two opposing contentions that the Commission learned about: The major one, from the Government side, is that university accounting systems are inadequate for the stewardship that they must show. The main contention about the Government from the university side is that the government's procedures do not appropriately allow for the conditions required to discover new knowledge, or for the multiproduct nature of activities within universities. You can see how if we continue simply to contend on those two sides of the issue that we will not make very much progress.

It is important to put the problem of accountability in its context. It is existing in a context where there is a life cycle of three stages in the Government's support of research. There is the selection stage, the selection of what research to support, which investigators to support. There is the actual conduct stage, and there is the reporting stage. Unfortunately, the operating understandings and the procedures of one stage do not always interact constructively with the other stages, and that is really the nub of our problem.

There are several major areas of concern: One is the use of Federal funds for intended purposes. The second major area of concern in accountability is the nature and extent of the documentation necessary to validate expenditures. The third is the systems and controls that are required for management of resources. The particular problems that are often cited, as you heard in our two days of meeting: The documentation of charges for salaries and wages, cost-sharing documentation, documentation of consultant costs, cost transfers. We have also heard from reports from the Government about inadequacies in cash flow systems and inadequacies in the acquisition, control, and accounting for scientific equipment. There has been a litany of charges.

The Commission also looked at the origins of these problems. It recognized that many of them arise from process and organizational differences between the two organizations that are trying to relate with each other. The distribution of faculty time-and-effort is a very major problem, a very major origin of the problems. In the first place, it is an attempt to use accountability on the process rather than focusing on the outcome. It assumes that one can account for 100 percent of faculty members' effort. That is a major change from the old A-21 to the new A-21, which has been overlooked in almost all of the discussion that we've had to date; is a major and very intrusive change for the universities. It is a very clearly appropriate expectation on the part of the Government. It is not quite clear that that expectation can actually be met, because I believe it is not widely understood that there is no definition of 100 percent effort in universities, no common definition. What is 100 percent effort for one faculty member is not the same as that for another. It varies by field, by faculty member, and from time to time. There is no standard work week for professionals in universities nor should there be; but even if those difficulties could be surmounted, there's no way to get around the joint-product nature of the activities.

Other special problems--origins of problems--are the diversity of the institutions. To impose uniform rules on the universities will be to sacrifice one of the greatest strengths they provide for the Government in carrying out research. Another problem is the design of the research support system itself. What works beautifully for the selection of research works terribly for the administration of research. In any given research university, there are somewhere between 2,500 and 3,000 projects. That is on top of all the other complexities of the sources of funds for the universities, a fact which is rarely ever understood outside the universities themselves.

The late arrival of award notices confounds the administration of projects but is a very, very common practice. The increasing specificity of proposals also contributes to the problem, and the rising concern about indirect costs.

The Commission wallowed in this for many months. We struggled over it because we felt that we had to do more than recite the problem and state it, that we had to come up with some suggestions, not as solutions, but to provoke discussion, dialogue that would lead to better solutions. We concluded from our discussions that there is in fact a very serious deterioration; that tightening of the rules and more rigid enforcement of the rules wouldn't solve the problem but would surely exacerbate it; that renewal of the relationship is going to have to be based on principles and objectives which both partners or both relating entities can accept; that because of the diversity, one will have to focus on principles, standards, and objectives, not procedures--and that is one major change about the new A-21 and the old A-21, that it moves farther towards procedures, away from principles and objectives; that management and accountability employed by the universities themselves must be consistent with research agreements, but also with the academic environment, and the universities are not blameless in this regard; that the nature and the extent of Federal constraints must be tailored to the type of activity, not by labels and not by Federally instituted activities themselves; that the universities must self-regulate more effectively; and that the Government must reduce requirements to the minimum essential.

We recognize that there must be an atmosphere of flexibility for research to flourish, and we recognize the fact that current management and technology is inadequate to the task.

We sought solutions, and one solution that we decided upon was that both partners need to recognize the principles by which each other operates, that that is a major problem in our relationship. There is gross misunderstanding, tremendous ignorance that pervades their relationship.

We tried to set forth some principles that we believed operate in each of our partners, and we have set those forth in the Commission's report. We then tried to derive some objectives which we felt were consistent with those two sets of principles. You will find those objectives listed in the report. I want to pass over those, because they are easy to read, easy to understand, and concentrate on the recommendations of the Commission.

Our first recommendation is that we must both--the Government and the universities--move vigorously to combat the ignorance which is undermining our relationship. One of the problems is that the partnership we have is not a partnership between two kinds of organizations, but an enormous array of individual relationships, and very few of the participants in this scene understand the whole picture.

We then moved on to make several recommendations about the accountability system that we have. Our second recommendation is that the accounting system needs to be changed so that the requirements--I am not saying procedures here, I am saying requirements-- are tailored to fit the activity for which they're going to operate. It states that A-21 must be revised within three to five years, as soon as possible; that the new revision should not be based on a tinkering with the current A-21, but instead should assure that the financial and administrative accountability incorporates features which not only control against abuse but also facilitate and encourage effective management; that they be fully consistent with the nature of the research process, which the current requirements are not; that they accommodate better to the academic environment in which they must operate; and most importantly of all, that they are based on mutual understanding of the purposes of the government/university relationship which the current A-21 principles are not.

Our third recommendation dealt in part with some of the difficulties that have been expressed by Hale Champion and also by Jim Kelly about the way in which audit findings are dealt with. We believe that a major problem has been the separation of the fiscal audit from the research outcome considerations; and we've suggested that at the very least, the scientific personnel in the agencies, the program officers, have a look at the draft audit findings and have an opportunity to comment on those, because they are the only ones in the Government who have the knowledge to comment on the relationship between the outcome and the dollars.

We have also suggested that the sponsoring agency program officers become more involved in a review of how the money has been spent and whether or not value has been received. The present situation recently has changed so that the program officers don't even have a reasonable financial report to work from and have no way of looking at that information.

We spent a great deal of time wrestling with the time-and-effort problem because we were convinced that a simpler and less costly method must be put in place. What A-21 now provides does not generate data that is really useful, but it costs a great deal, not only in money, but also in wear and tear on the academic system. It doesn't fit in the academic system, and a fundamental principle about accountability and accounting requirements is that the process must fit the organization in which it is to be used.

We finally suggested something which is not within an accounting principle, at least not within those that have operated in the university/Government relationship, but I understand that it's not foreign to the accounting profession--namely, a certification process. We had suggested that when the principal investigators complete work on an activity, that they reflect in their technical reports to the agency a statement about the reasonableness and fairness of the charges for salaries. We suggest that the institution provide a report on what the salary charges are--that the program officer be asked to look at that report and respond to the reasonableness of those charges; that is, on the one hand you look at the technical outcome and on the other hand you look at the salaries charged, and you say, "Is this reasonable?" To certify distribution of effort into 13 categories, which is what is required under the new A-21, generates data which is not going to give you any better assurance that accountability has been achieved.

Now, that sort of system leaves you wide open to say that the program officers and the investigators had the same goals in mind and therefore some independent review is also necessary. We added, in our suggestion, that the payroll systems of the institutions should themselves be audited to make sure that they have adequate controls to prevent fraud, and that, in itself, would be sufficient to assure that the effort involved is appropriate for the activities and that the government and the public are receiving value for their investment.

To make that work--a documentation of direct charges of faculty effort--we have to find some way to deal with indirect faculty effort, because for many institutions that is a substantial cost. We therefore derived a new suggestion very much analogous to the standard deduction in your income tax, for this one minor component in the indirect cost layers. In some of the slides you saw yesterday, you will remember there was a section of the indirect costs labeled "Departmental Administration." It is in that layer of indirect costs that faculty effort on administrative activity is counted. The faculty effort in that layer is a small portion of the total layer, but not so insignificant that it can be ignored. Nevertheless, the requirement that we be able to document that effort and assure that there is no overlap between that indirect effort and that direct effort which is charged to sponsored projects is what drives this enormously complex time-and-effort reporting system now proposed by A-21. We suggest that the universities who balk at the notion of having this detailed distribution of effort accept some lower recovery for the privilege of not documenting. A standard deduction would allow that. That standard deduction would be a fixed percentage of the total costs borne by the Government for R&D at the university. It could be a fixed percentage that is negotiated on an institution-by-instituation basis, or it could be a fixed percentage for the whole country, just as our standard deduction method is for the Internal Revenue Service.

The Commission is not wise enough to make that choice. It did feel that it could suggest that it is well worth backing off from absolute full recovery, which the universities are a long way from doing anyway, by having this kind of an estimate, this kind of an approximation. The combination of those two recommendations about certification of salaries and wages would be extremely simple compared to the present system and much less costly. We also believe that they fit the research process and the academic environment.

The sixth recommendation of the Commission was addressed to the universities themselves--namely, that the university presidents must carefully review their financial management systems to assure that they are adequate for control of public funds. That is not an indictment of the present system. It is not an admission. It is simply saying, "University presidents, you have a responsibility to make sure that you are in fact able to do that."

We did feel that it was probable that many universities were not providing adequate information to the principal investigators so that they could be responsible for all of the funds that they received. That is because many universities do not have information systems that will provide prompt and accurate accounting data to the faculty, and we felt that was something the institutions must move immediately to address. Otherwise, there is no way that we can expect the principal investigators to carry out the responsibilities that all of these sponsored programs lay on their shoulders.

We realize that in the past the universities tried to shield investigators from much of this paper work, but in some ways, that very shielding has led to the current problems. I believe many universities have found, as they have tried to discuss the implementation of the new A-21 with their faculties, that they didn't know what A-21 was in the first place. That doesn't mean that they weren't following the rules; it does mean that many of them were unaware of the origin of the rules.

The Commission felt very strongly that the Government and the universities need to develop revised financial and scientific accountability processes that will increase flexibility and incentives for investigators to manage research funds in a prudently scientific manner. Many of the rules that we now have are very counter-productive for that goal. The Commission suggested a few specific things that might be done, and not only because they believed that they were important and should be implemented, but also because we hope to stimulate other ideas along the same lines. For example, further delegation of authority to make budgeting and management decisions under sponsored projects. At the moment, NIH is one of the unusual agencies in delegating considerable authority to the institutions. The Commission suggests that NIH extend that privilege and responsibility and that other agencies follow suit.

We suggested that there be considerable experimentation with aggregation in the administrative phase. There are ways to administer related grants together that will enhance their productivity and yet be consistent with the integrity of the appropriation process. We also urge that there be elimination of unnecessary restraints on the timing of expenditures. The current segregation of project periods and of projects themselves means that if the researchers followed the rules exactly, they would be far less productive than they are now. In many ways, the system has been as productive as it is because the investigators have been somewhat ignorant of the rules, and both the auditors and the university administrators have been willing to overlook the extent to which one works around the edges.

In one of the discussions earlier--I think it was even Bill Carey, with whom I don't often disagree--there was a statement that we must be able to prove to the Government what the problems are so that they will be resolved. This reminds me of arguments in my own institution--and in this, let me step over here, because I'm not acting as a Commission member. In my institution, in trying to help the faculty approach change on university procedures, my pitch has been, "You must document them. You must show what the impact is. You must explain that." Their response to me is, "Administration serves research, not vice versa," and I would suggest that that is an important thing for the Government and the Congress to recognize, rather than demand that the researchers learn how to lobby, politicize, and develop costly ways to prove that what they are doing is all right.

The last recommendation that the Commission made in the accountability report, Neal has already mentioned to you--about making sure that accountability processes are themselves accountable. Our primary examples for that are the time-and-effort reporting and the documentation of cost-sharing. The latter, which is now required, is a very meaningless, unproductive, and wasteful process.

In its report on the funding mechanisms, which will be out shortly, there are two or three recommendations that I think might contribute to this discussion. One also takes up the cost-sharing issue. In the accountability report, we have recommended that the documentation of cost-sharing be eliminated because it is counter-productive. In the next report, the Commission has pointed out that the rationales and requirements used for cost-sharing in the government/university relationship are diverse and rarely now really fit the situation. There is a tremendous confusion about when cost-sharing is required and to what extent and for what reason. If there is going to be continued cost-sharing between the Government and the universities for the support of research, and I think there always will be, then there should be a better understanding of why and under what conditions.

Another recommendation in the next report is that in the array of funding mechanisms that support research, there are some missing elements. The distribution of resources among the existing array is in itself a statement of policy, but interestingly enough to the Commission, until we put the data together, no one had ever really shown on the total Government picture how the resources are distributed among the different kinds of funding mechanisms by agency. We believe that since that is in itself a statement of policy, it is an indicator that should be watched closely so that fine tuning can take place in a rational manner.

We have suggested experimentation with a grant-in-aid or fixed-price grant. Apparently the term fixed-price grant has knee-jerk reactions in some quarters that we want to avoid, and so we have called it a grant-in-aid. I mentioned this yesterday in the discussion. I will just repeat it for those of you who were not here. We have in mind experimentation with some project grants in which the total amount would be awarded on the basis of the usual review processes and budget presentation, but that the reporting would be on a technical basis only. Some people call that the put-the-money-on-the-stump-and-run type. That is not really what the Commission has in mind, but we do believe that for some types of grants, that might very well be the most efficient way and the best way to be accountable.

We spent a great deal of time in the Commission discussing the difference between procurement and assistance and the unfortunate confusion of the two in our long history together. One of our recommendations is that most of the university research is not of a procurement character, and the continued imposition of procurement-type regulations is very inappropriate, costly, and quite unproductive.

DR. FREDRICKSON: Thank you, Dr. Wilson. You know, this meeting was called before any of us were aware that this report was coming. It has nothing to do with the timing of this meeting, and yet I think it is both fortuitous and fortunate that the report is before us, because in a way it lays out a blueprint of recommendations with which not everybody may agree, but there is substance here for thought. It almost provides the basis for any set of recommendations that might have emerged from this meeting were we to attempt to prepare them.

So I hope that we will take those illicit coffee cups out and fill them and come back in about 10 or 12 minutes for the final period, where we want to consider where it is we go from here and look at these recommendations if you want to comment on them.

(Brief recess.)

DR. FREDRICKSON: Saunders Mac Lane from the National Academy would like to summarize an Academy position relative to the subject we are talking about.

DR. Mac LANE: Some of the members of the National Academy, in particular Mac Lane, feel like Rip Van Winkle. At the time of World War II, when there was that wonderful Blue Book from the Office of Naval Research, we thought that everything was all under control, and we looked around the university and saw all those multiplying vice presidents, and we went ahead with science.

At the University of Chicago, we were especially happy. The legendary figure there, as you may recall, is Enrico Fermi, and one of the stories about Enrico has to do with the Manhattan Project--that General Groves came to him and said, "Dr. Fermi, these scientists come in late and leave early and don't seem to be there. Shouldn't we have some regular punch card where they punch in and punch out?" And Enrico said, "Oh, that would be a good idea. Now, let's see how we would work it out. You should have one of these punch cards at my dinner table so that when I stop eating and start thinking, I can punch in there, and then perhaps you need one by the side of my bed, because sometimes I wake up at night and think for a half an hour, and then I have to have one in my pocket, because sometimes when I'm walking those five blocks to the university, I think then too. So with all these machines, we can keep accounts very carefully." He never heard further words from General Groves on the subject.

Now, we've observed the new A-21. It's important that our Rip Van Winkles wake up. It's a very complicated situation, and I have tried to take some time. I have talked to Mr. Lordan and Mr. Kirschenmann, trying to understand what's there, and I agree with Dr. Wilson that that 100 percent is the crucial thing that seems to me new and different in this A-21 and raises some very fundamental questions. It is certainly a complex issue. One thing that strikes me as complex is that the needs of accountability are real. It's not clear that having 100 percent accountability is going to catch the abuses or do the things we want to accomplish out of that. I understand part of the objective is to reduce the increase in the growth of overhead. I am not sure it will do that, and the essential issue still comes up in this remark of Fermi, that professors and scientists can't tell exactly how their time is distributed. There is an intrinsic mixture between teaching and research, and the effect of the 100 percent accountability on that is most unfortunate.

Now, in your books, under Tab M, you have an earlier version of my understanding of the difficulties, and at that time I wrote, "The call for 100 percent accounting of the work for which the employee is compensated appears to suggest possible Government control over that portion of this work not supported by Government funds. Even the implication that there might later be such control seems inappropriate."

I wrote that before I got all the documents, and later, Mr. Kirschenmann gave me a copy of the HEW interpretation of the OMB Circular A-21, and under "monitored workload", which otherwise might be a useful thing, it says: "In addition to showing the activity applicable to each category, the assignment document should also describe the assignments in sufficient detail--e.g., specific courses, specific administrative assignments, et cetera--to support the initial distribution."

It seems to me that the specific courses taught by scientists or others at the university are not properly the concern of the Government, and I think for that reason that the present A-21, as to the distribution of time, does need reconsideration; and at its meeting on April 22, the business meeting of the National Academy of Sciences passed the following resolution: "While supporting the principle of accountability for usage of public funds, the Academy views with concern the proposed implementation of OMB revised Circular A-21. Application of these new regulations to institutions of higher learning would further constrain the already limited flexibility in research thrust, increase the administrative burden, reduce morale among teaching and research personnel, and provide a cumbersome, meaningless documentation in terms of percent of effort for a continuum of scholarly activities. Moreoever, because these regulations would monitor nonfederally supported academic functions as well, inappropriate controls might be exercised.

"We therefore urge reconsideration of regulations embodied in A-21, and we recommend that the Council of the Academy examine the situation so as to propose appropriate ways of achieving accountability."

Thank you.

DR. FREDRICKSON: Thank you, Saunders. Are there questions or comments? Henry?

MR. KIRSCHENMANN: Yes. I really need to comment on that, because I think it's pretty indicative of perhaps the concern that faculty have about what time-and-effort reports are used for, and I think that there is a great misunderstanding about that and about the need for 100 percent of accountability. The time-and-effort reports are not set up, are not required so that the Federal Government can at some time second-guess a faculty member or insert its judgment as to what a faculty member should or should not be doing or how much effort they should be devoting to whatever it is they are doing.

What it is is a mechanism for computing cost. It is a mechanism for the institutions to identify what it is that they are charging the Federal Government for, primarily in the area of indirect costs.

Now, the departmental administration overhead pool, which was mentioned before, contains some considerable amount of charges or portion of charges for faculty member salaries, and what we are asking for is some support for that amount you are charging. The second major reason that effort reports are kept or asked for is because of the computation of the rate itself. The overhead rate and much of the allocations and distributions of cost between research, instruction, and other activities of the institution is based on cost, and a major element of that cost is faculty salaries and wages. Somewhere between 60 and 70 percent of that cost is salaries and wages.

We are asking for the effort report in order to measure that. There is no other way of getting that information, as far as we know. If there is another technique for doing this--for arriving at distributing those costs, relating costs to research and instruction, other activities, so that you can be reimbursed for it--we would be very happy to entertain it and to look for it. We just don't know what that is at this point.

Now, we have been asking the university community, anybody we've been able to talk to for the past ten years, to come up with an alternative to this, and as far as we know, there has not been any alternative. But I think you need to be disabused of the notion of a nefarious purpose of these effort reports. It has nothing to do with academic freedom. It has nothing to do with the flexibility that researchers are going to be afforded in conducting their research. It just has nothing to do with that, and we ought to get away from that point, it seems to me.

DR. FREDRICKSON: Saunders?

DR. Mac LANE: If Dr. Fredrickson had given me a little more time, I would have said about three quarters of what Mr. Kirschenmann said just now, because I learned these things by talking to him. Certainly there is no feeling anywhere, Henry, that there is anything nefarious in this, and had I had more time, I would have explained. Of course, what has happened is, looking at the complicated costs, one asks how one can account for it. But I think the result is a situation where that question of accounting has led the people looking at it step by step into requiring things that in the end are simply not appropriate to the university; and as I say, Mr. Kirschenmann, the statement in that OMB interpretation as to specific courses ought not to be there. It will be important that that statement, and things like that, be removed.

MR. KIRSCHENMANN: But let me tell you why that statement is there.

DR. Mac LANE: I know why it's there.

MR. KIRSCHENMANN: Why is it there?

DR. Mac LANE: Because that, at the moment, as you just now said, seemed to you, in good conscience, to be the way you could get at computing these costs. So you had good reasons for putting it in.

MR. KIRSCHENMANN: But let me go beyond that. You see, the monitored workload system--and I happen to agree with Jim Kelly--I think this is really the way to go, both from the institution's point of view, because I think it fits in exactly with their budgeting and accounting process, and from the Federal Government's point of view, because I think it does require less paper work on your part.

But the monitored workload system is based on a premise that says that when there is a major change in the faculty member's workload as a semester moves along--and by a major change we're talking about a change in course, teaching load, a change in the addition or the termination of a grant, major sabbatical, long-term sabbatical leave, any of these major changes--that the institution at the time of that change needs to make an assessment as to whether or not that change requires a reallocation of the individual's salary. You cannot make that judgment unless there is a knowledge of what the individual's workload is to begin with. That's the only reason for that. It's a base. It's a foundation from which all other judgments are made. Now, again, if there is another way of getting at that, that's fine, but that's not for the Federal Government's purpose. That's for the purpose of the individual who is making a judgment as to whether or not a change has occurred in the work--in the required workload of an individual--which needs to be reflected in a change in the distribution of his or her salary. That's all that is.

Again, if there is a better way of doing this, I'd like to know what it is.

DR. Mac LANE: Well, I think there are better ways of doing it, but I think it will take working and consultation to get them, and I think one of those better ways is to distinguish those things that faculty members do for the university and those things which they do under grants and contracts, and the present arrangement doesn't sufficiently do that. It will take consultation to get it.

DR. FREDRICKSON: Dr. Wilson?

DR. WILSON: The discussion here, for those of you who haven't read the HEW interpretation, may be a little opaque. Let me clarify one thing, because it is a good example of the problem between the two parties.

The HEW interpretation spells out that in the monitored workload system, which is built on an assignment basis, that the workload assignment of the individuals is put in place at the beginning, and then major changes are put in as corrections to the system, and at the end of a year, there must be a certification that those charges are reasonable. That is the way the universities generally operate in terms of assigning people to tasks and keeping track of things, and in fact, that was a university proposal.

The DHEW interpretation spells out what the assignment must consist of. The need for spelling out the course load is put in my HEW's interpretation so that the auditors can have some way of documenting whether there was in fact a major change. The universities do not need that kind of information to know whether there has been a significant change or not. They do need that kind of documentation if they are going to prove to the auditors that a significant change or a major change has not occurred except when they said so, and that's a terrific illustration of the way documentation to verify, to satisfy auditors is adding more and more administration. The universities don't need that documentation in order to notice whether or not there is a significant change in their faculty assignment. Would you agree?

DR. Mac LANE: Yes.

MR. KIRSCHENMANN: Enough said.

DR. FREDRICKSON: Thank you, Linda. Federico Welsch from the Worcester Foundation.

DR. WELSCH: These days, we've been speaking mostly about research in universities, but about 10 percent of research supported by NIH is done (between quotation marks) by "single-purpose institutions"--research institutions. I think I'd like to amplify Dr. Wilson's comments. In our type of institution, we submit grant applications, say that such and such an amount of effort will be committed to a specific grant, but still we are required--and I understand we will be required by a new or changed form of A-21, which is supposed to be published pretty soon--we will have to provide the papers, monthly or perhaps longer periods of time, for our faculty.

Again, it's a question of cost versus benefit.

DR. FREDRICKSON: We have, I think, certainly had virtue in meeting together the last couple of days. Certainly, I have learned, and I think all of us have, that we really have to reach out toward each other to sort of save ourselves from being entrapped in our own ideologies; otherwise we're going to be completely unable to join in a very essential common effort.

We have heard from most of the sets of voices. At worst, we have heard that the auditors, using very blunt tools, are trying to force science and teaching into molds that are constructed for commerce. The scientist, it seems, is myopic and can only see to his door, but not beyond to the bigger dimensions of the university and its multiple purposes. The universities clearly are obsessed with costs, but that's not the real problem: It's that they risk bankruptcy in proportion to their aspirations to maintain great faculties, and they seem unable to grapple with the demands for documentation for proof of their own fiscal credibility.

But there is one other set of voices which has not spoken, and that is the Federal managers; and the fault may also lie partly with us, because I think that we have, for a long time, tried to ignore the fact that in many ways there are really two universities. One is that collection of delightfully heterogeneous places which provide scientists with faculty, rank, and tenure. But there is another which is characterized by being a universe of most of the scientists in universities whose being is partially created and whose employment is determined, and often periodically renewed, by a system that is outside any given university, but one for which we, as Government officers, are the stewards.

I think that we have often concentrated on the second and tried to believe that it was the first that was responsible for the action. If that is a fault, it is because we have the excuse that the quality control we supervise is a far more important criterion of the product we all seek commonly to achieve than is any kind of fiscal accounting. But we have been very loathe in the past to mix audit with program, and I think that that compartmentalization in our way of doing things within the Federal Government must somehow be changed to make us more effective partners in seeking some relief from these really serious and important problems that threaten something in which we all equally believe. That is a very important curatorship that all of us have over something more precious than our generation or our time.

The Federal Government, as it is seen in its program managers here at NIH, does not have ready answers to your questions. I thought, though, that it might be useful just to let one person who represents a focus of important responsibility for helping us seek better solutions to just give some opinions of his own very briefly, and I will ask Bill Raub if he would like to speak for a few minutes--if not for NIH, at least for himself and his ilk. Bill is the Associate Director for Extramural Research and Training at NIH.

DR. RAUB: Thank you very much, Don. In this case, it is a relief not to be speaking for NIH. John Lordan was concerned yesterday about possibly being cast as a villain, making his entrance in Act II. My initial concern with my place on the agenda was that I was to be cast as the deus ex machina, leaping from the wings with resolutions to all of these problems.

DR. EISENBERG: No?

(laughter)

DR. RAUB: I ain't him. In fact, I don't even have a Casey Stengal joke. What I do have are some observations using the Commission's report as a scaffolding of three particular areas where an individual agency can take some action. These topics are more like dealing with an individual piece of stained glass in a very complex issue and are hardly viewed as system solutions, but there are some things that we can do, or at least we can study. One of these I will label as an ongoing initiative. The second is an opportunity, and the third is a dilemma.

I will be making some brief reference to Commission recommendations. For those of you who might want to refer to them specifically, they are behind Tab H, on pages xii and xiii in the Executive Summary.

The first example under Progress Reports on Grants is an ongoing initiative that is independent of but fully related to the Commission's recommendation 3B. That's the recommendation that calls for some greater participation of program managers in the larger process of certifying that value was indeed received for the funds awarded. Coincidentally, there are some changes under way in the standard format of the progress report for the noncompeting grant application that are a major step in this direction.

Historically, as has been stated several times in the last few days, the grant relationship is a best-efforts one. A manifestation of that has been, traditionally, progress reports on the noncompeting awards that take the characteristic of basically a free-form narrative documenting the scientific progress, with frequent references to refereed articles, manuscripts in development, and so on, and ritually detailed financial reports using the dollar surrogate as a measure of the scientific best-effort.

Over a period of years, the amount of detail in those fiscal reports has dropped. About two to three years ago, there was some discussion and a Government-wide decision by the OMB that we would reduce the financial reporting associated with individual grants to what is essentially the minimum. This OMB decision was based in large part on strong representations from universities and other institutions that the financial reporting requirements were onerous and unnecessary for the task at hand.

Basically, financial reports as of now on grants consist of three numbers: the total that was awarded, the total that was expended, and the total that is left. One of my mathematically inclined colleagues points out that one needs only two of those numbers. Nonetheless, the operating agencies have accepted the challenge of developing alternative expressions of progress on the award to substitute for the fiscal surrogate that we've been using.

Our approach to that has been to add additional structure to the scientific report to go along with the traditional free-form narrative--a structure that will give us the opportunity to capture some picture of the configuration of individuals and expertise that has been brought to bear on the problem, will give us some binary kinds of identification as to whether major pieces of equipment were acquired or not, and so on. I believe this is a small change in the cosmic scheme of things we have been discussing. However, it will introduce, if adopted, a perturbation in the equilibrium that has set into that set of metabolic pathways where grants officers in the institutions and faculty interact, where the institutions interact with NIH, where our grants management staff interact with our own scientific administrators, and where all of us interact with the Congress specifically and the public at large.

As has been indicated by Dr. Wilson and others, change is costly. It is costly in dollar, and it is costly in energy and thought and sometimes gastric mucosa. When this particular change plays out, we will have an opportunity not only to assess something about the costs of change in this complex pattern of individual and institution relationships, but also an opportunity to assess the feasibility of carrying out recommendation 3B, because if successful, this new format of scientific reporting might give us the administrative structure upon which to make some judgments, both within the institutions and on the part of the program managers as to the reasonableness of the scientific effort, and therefore the reasonableness of the expenditures that will later be claimed.

Moving to a second topic, under the heading of "Aggregation"--specifically, recommendation number 9--there are two aspects that I found worthy of comment: One, there is, I believe, only indirect reference in the Commission report to the notion of a multiple-project award--in NIH parlance, the program project grants, the center grants. This is not a commercial for the program project grant. I know of few topics that stir more animated debate within the scientific community and among our own program officials than does this topic, but one thing bears mention, and that is, by paying the price of substantive aggregation at the time of preparing the application, and paying the price of reviewing that very difficult request and administering it subsequently, there is a dimension of flexibility with respect to handling funds and activity that goes beyond many of the things that even the Commission has suggested. That aspect of the program project grant is one of the things that needs more examination, in the light of the other varied opinions substantively, ranging from that it is the only way to do certain ensembles of science to the opinion that the program project grant brings out the worst entrepreneurial characteristics of scientists and imposes an unnatural set of hierarchies in a community of scholars and should be used only with great caution.

On a more practical matter, but no less important, the current Public Health Service grant policy makes a limited provision for aggregation of salary costs where two or more grants contribute to the funding of a particular individual. That provision is in the fine print. It is rarely exercised, I am told. It is one that bears some further examination and further promotion. It is limited now by the constraint that it applies to the confines of a single appropriation; and as most of you know, with NIH having multiple appropriations, we would need to seek some special relief to apply that across several of our Institutes, no less than across several Federal agencies.

Further, there is also the prospect of broadening the flexibility of that beyond the personnel category to other areas, especially supplies and equipment. It is something that an individual agency can do, and my personal opinion is that it is well worth some exploration on our part with higher levels of the Executive Branch and with the institutions and the scientific community.

Finally, recommendation 10 that deals with carryover is in the category of dilemma for most program managers. Were I a principal investigator on an NIH project grant, I would love the notion of being able to have some automatic percentage of my grant carried over from one year to another, without need to explain or justify. Were I a university administrator, I would feel much the same way, perhaps for slightly different reasons.

From the point of view of the NIH program management, however, the so-called "savings"--that is, the amounts of monies that are realized in the annual negotiations each year, as well as the amounts of money that are unexpended and never proposed for carryover--constitute almost five percent of the amount awarded for noncompeting continuation grants. A program administrator is therefore faced with the dilemma of trading off the desirable flexibility for science that would come with some relaxed carryover provision with the prospect of not being able to make as many new and competing renewal awards as might otherwise be the case.

Furthermore, there is the practical difficulty of each year needing to compensate for the adjustments in indirect cost rates that go on. As some of you know, indirect cost rates generally are set in a provisional base and then replaced with an actual value for that particular year or time window. Adjustments, in theory, may go up or down. The predominant experience over the last 16 years has been that they go up, for the most part.

Our grants management staff have had the statistical certainty of being able to count on a degree of savings as automatically creating a fund that, among other things, could cover those indirect cost adjustments. My personal opinion is that one practical avenue to explore, and perhaps a way out of this dilemma, is to link the desirability of more carryover for scientists with the possibility of fixing indirect cost rates and thereby establishing a slightly different pattern of equilibrium and perhaps efficiency than now occurs.

In conclusion, I think I can speak for NIH in saying that we will continue our tradition of trying, and trying very hard. We all take a good deal of pride in those who came before us at NIH and pioneered the institutional prior-approval systems that have been cited in the Commission report, and we certainly are willing to continue in not only promoting the Government-wide adoption but in sharing in the development of any specifics.

This last day and a half, we have dealt with a scenario that has many of the elements of a Greek tragedy. There are sets of forces around us that seem to be bigger than all of us and seem to have no one in charge, and they all too frequently seem to resonate with our own tragic flaws, which make the effects of those forces all the more visible. I don't believe we are being driven, however, to some inevitable destiny. This is a play in which the players can alter their roles and influence the roles of the others. It seems to me that as long as those of us who are part of the supporting cast keep in mind that there are two players--namely, the individual doing the research and the individual taxpayer who is paying for it--that those roles are predominant, then we have a chance to work our way out of an otherwise possibly hopeless situation. Thank you.

DR. FREDRICKSON: Jim Kelly?

MR. KELLY: Let me ask a question, Bill. I have a recollection--I can't recall whether it's related to an internal audit report or a Comptroller General's report or what the source of my information was, but it relates to this whole question of accountability from a scientific standpoint--and that was that very many of the required progress reports were never filed, and moreover, that a final report on a completed grant had not been filed as long as five years later. Query: Has that been corrected, or is it still a basic problem that the institutions don't really fulfill the obligation of reporting on their research?

DR. RAUB: In my experience, the problem was never as you stated it. That is, the progress report associated with a request for continuation is virtually 100 percent in compliance because of the character of that continuation. There is a small problem continually associated with the final report, especially where that particular project isn't renewed. We have a standard alerting mechanism that includes among other things a letter from me at some appropriate point. By and large the cases are quite isolated. There has been, in my experience, an increasing degree of cooperation, and I don't believe there is a first-order problem on that score.

DR. FREDRICKSON: Are there other questions of Bill Raub? Dr. Hansen?

DR. HANSEN: Do you think the 5 percent is really the result of the accounting method--that is, that PIs must leave some in their budget until the university accountants get through--versus how much do you think would be there if that system still was changed?

DR. RAUB: My impression is that it is fully part of it. I believe the Commission has some reference to the effect of the importance of timeliness in the internal reporting from institutional financial managers to principal investigator, and no doubt that contributes to the problem. I believe at least as big a contributor is the sheer reality of having to budget. The consequences of a cost overun are severe. The likelihood that one would ever line up a new employee in the position of a departing employee without having a discontinuity is almost zero in most cases.

DR. FREDRICKSON: John Sherman?

DR. SHERMAN: Two comments, Don. The first, having sat through many meetings of this sort over the years, I think this has come a remarkably long way toward the consensus you laid out as the challenge yesterday--namely, to define the problems--and therefore I think we owe you and your colleagues a real debt of gratitude for taking this first important step in such a productive fashion.

The second has to do with something that I believe is a certainty--but it might be useful to be sure of that--which is the fact that our whole system is built on legislation that establishes the project as the basis for everything we do, whether we're talking about any of the three phases that Linda mentioned. Are we indeed able at this time to reaffirm the keystone nature of the project as the basic unit of doing business? Or should we say that it's probably true, but we ought perhaps to identify not only supplemental sources or instruments, but perhaps reexamine that fundamental consideration.

I, for one, feel that despite its obvious contribution to many of our problems--regardless of where you're sitting--that the project system has stood the test of time. But it might be useful, in the context of being certain of our starting point in some of these solutions, to be sure that that's one of the givens.

DR. FREDRICKSON: Your question is at least partly rhetorical. It will stand in the record. It is one that needs to be answered, yes. Stuart and then Federico.

DR. BONDURANT: I would like to ask Bill a question from the point of view of a nonspokesman of NIH and all those things; but among the issues that have, I think, been sort of floating around the table the last two days is the question of the evaluation, or the accountability, from a purely programmatic or scientific perspective. And Linda, I think, earlier suggested that maybe we--if I understood her correctly--maybe we need to think some about a balance between programmatic assessment and accountability. That leads me to pursue the notion of what are we doing right now in the way of programmatic accountability on an individual project basis?

My recollection is, like Jim Kelly's, that there was prior severe criticism of the reporting system of the individual project grants, and there was documentation, I think, in the early Fountain report or Wooldridge, or one of the earlier ones. This was mentioned, that for the nonrenewed grants, just the ones that you were describing, there were a fair number of them that were open-ended five years later. What I'm pursuing is the question of would it be worthwhile from the staff point of view to consider whether there is anything that could be done to strengthen this aspect of the accountability system beyond what we now do?

I know it's a complex question: How do you measure the value of science and so on? But I just wonder if you had given thought to that dimension of it.

DR. RAUB: Indeed, my brief comments about the new structure for a scientific progress report were along those lines, and there will be some other public forum where we can go into more detail about what the characteristics of that would be and how I believe it addresses this issue.

In the past, it's been convenient for both the scientist as principal investigator and the NIH science administrator to deal with a free form and often brief narrative account of the progress because of the information that could be gleaned from those detailed fiscal reports. It's not just whether the money was spent and for what, but something about, in fact a good deal about, the nature of the effort, the enthusiasm, the direction of the activity, and so on.

In the absence of that fiscal crutch, a somewhat more structured account of the scientific activity will be needed. Otherwise, we will be unable to fulfill our accountability obligations to the Congress and to others. I believe that much can be done. We would not have proposed this restructured scientific form if we didn't think it could be better than where we were. The danger inherent in this task is one that the Commission report notes very clearly, and that is if the scientific accountability is translated into a tracking of the specific goals and specific methodology laid out in the original grant application, it reduces science in general, and basic science in particular, to an untenable straightjacket; and the swamp we must negotiate is to find a way to express scientific best-effort without setting up not only an unrealistic but a damaging set of constraints with respect to the specific substance of that original grant application and where the ideas and the research results leave the investigator.

DR. FREDRICKSON: Federico Welsch, did you have a question?

DR. WELSCH: Yes. It really was a very short comment on one of Bill Raub's statements, and that is the 5 percent carryover. I think one should very carefully weigh the advantage of funding a few extra projects at the end of the year versus giving the flexibility to the scientists who presumably have had much higher priority and therefore got their funds.

DR. FREDRICKSON: Leon?

DR. EISENBERG: One of the issues that I hear recurrently through this discussion is the problem of deciding on accountability by a large enough sample and a reasonble bottom line so that one can tell whether the job has been done well and not be distracted by either an occasional glaring failure or misled by an occasional marvelous success.

It strikes me that the problem in the auditing and accounting professions is that the penalties for an occasional oversight or error far outweigh any benefit to be gathered by having enabled something which turned out by accident to be honest. That is, there is a terrible asymmetry in the rewards and punishments in administrative roles. Not doing something is likely to keep you much better protected than doing something--that is, insisting that everybody document means that if they cheated, it's their fault because you asked for everything; whereas if you allow some flexibility, which means that somebody could cheat and be caught with more difficulty, the fact that 20 people did a much better job at less cost is somehow overlooked.

And that includes even the assessment of the part of the OMB that looks at NIH funding--that just as we are talking about scientific accountability replacing some of the auditing and financial mechanism, I would like a consideration of whether the auditing job has been done well--whether it took into account that although a few people may have cheated, most things went very well, and that the enterprise prospered.

It seems to me that just as a psychiatrist who sits in charge of an institution for people subject,theoretically, to criminal behavior, and makes the decision to let somebody out, is terribly answerable if a month, a year later the man kills somebody, so the judge who sentenced him for a limited term is not blamed for the error. And that seems to me the dilemma for anyone in an administrative role; and it applies to auditors--that five people caught cheating at a university draw a lot of attention while the 1,000 universities that quietly did a more efficient job go unnoticed. What of the fellow who kept a clean account all the way down the line and tangled so many people in red tape that the whole enterprise ground to a halt?

Now, these are obviously exaggerations, but somewhere or another at some level, this problem needs to be engaged.

DR. FREDRICKSON: Linda?

DR. WILSON: The question that John Sherman raised, about whether the project as the backbone is the right approach to continue to take, is one the Commission has looked at and debated long and hard, and in fact, is a part of the subject of the next two reports. I think what we feel is that the project is a very good way to select science, but that unless we recognize the limitations of that as the framework, the problems, the undermining of certain relationships that it engenders, and the trade-off that you must make, that then we will continue to have problems, and I am afraid what we all haven't learned is that we'll never have a system that will be perfect overall, and that there actually must be trade-offs.

We looked a lot at scientific accountability because we went into the game wanting to shift a lot of attention away from fiscal accountability. The cost of assuring scientific accountability is probably higher than the cost of assuring fiscal accountability in terms of administrative cost. I am not sure it's higher in terms of the overall objectives, and what we were led to is that pressing for scientific accountability on a grant-by-grant basis is probably an error. The system we have now works remarkably well for choosing good science and getting good science done. What we probably need is retrospective evaluation in fields, not by grant-by-grant minute detail, but a review that wise choices were made in scientific fields, and you can't look at that on an annual basis. One has to look at that over a range of time. One doesn't look at it from the point of view of fixing blame, but from the point of view of making better decisions in the future.

The second-guessing that could come from a heavy emphasis on scientific accountability on a grant-by-grant basis is a major danger that we will have to avoid, because the scientist sitting in a chair in an office can't second-guess a scientist at the bench without going back and doing the same science to see if he would have come out in a different place.

So I guess what the Commission is really suggesting is that the accountability itself is fraught with dangers and that one should look at the whole picture and very carefully choose, so that what you do is not lose the whole show in an effort to document accountability.

DR. SHERMAN: That question arose in my mind as

Bill described his plan for changing the form and the nature and presumably, therefore, the purpose of the progress report, ranging all the way from the purely practical considerations of who is going to do what with them, to what they mean in terms of some new purpose.

DR. FREDRICKSON: Yes. Henry Meadows?

MR. MEADOW: One of the things that has happened to me this morning, and I am not particularly happy about it, is that I have come to the conclusion that in spite of the fact that we said that we wanted to understand each other and that we felt we have made progress in understanding one another, that this really doesn't seem to be the case. No one has talked about the institution's role in scientific accountability, and I can tell you that the faculty at Harvard spends more of its time examining the scientific stature and progress of its members and of the students than it does almost any other thing. This is something that ought to be taken into account when we're looking at scientific accountability.

Another thing which apparently we don't understand is that we can't mix appropriations because the Congress, in its wisdom, won't let us. Maybe we've got to do something about permitting people to mix appropriations, if this is necessary, in order to provide a coherent framework in the manufacturing arm, if you will forgive my using that phrase--namely, the university.

But I think if we can just get down to these issues--explain how we do act and what is important to us and what we are constrained by. I thought we had done this over the last 40 years, but I guess we haven't, because I am hearing the same things now that I heard 30 or 40 years ago. I hate to confess to that much exposure to this problem. There it is.

DR. FREDRICKSON: Well, Henry, maybe it hasn't been said because most of us think we know it, but you're right. We all have to be sure we know the same things, if that's possible.

You know, it would be a lot worse if we were sitting around here in Bethesda today because the excellence of the achievement, the substance of discovery were the question. Let's be very grateful that it's just a matter of dollars and cents.

I am really grateful to all of you for coming together because I think we've learned some things that were important. It has improved our mutual understanding of the anxieties and the needs and the ambiguities, and we at NIH certainly will do our part to continue imaginative efforts and to do what we can to bring our communities together in moving toward some resolution. The problem is difficult, but I don't think it's impossible.

The mark of a small mind is to like to end morning meetings at noon. But we need to transact a little business, which should take about 30 seconds. There are before the Congress two Acts which bear very much on the host institution, the National Institutes of Health, and we have provided for you, in an utterly neutral, League-of-Woman-Voters fashion a description of these two bills, S. 988 and H.R. 7036, both of which are through their parent committees and heading toward open water. We'll provide these for you as you go out, and I think you should study them. I am grateful to a team that prepared this, the principal actor of which was Peter Slaven, who, in keeping with the authors of most of the important health legislation of our time, is about to enter medical school this fall.

And I do want to thank you all very much for coming. We will stay in touch. We have learned a lot, and we have enjoyed it, and I know that you have, too. With that, our meeting is officially adjourned. Thank you.

(The meeting was adjourned at 12:10 p.m., on May 14, 1980.)

PART II

PROCEEDINGS

Meeting of October 20-21, 1980

Planning Meeting for the Forty-First Meeting of the Advisory Committee to the Director, NIH (October 20-21, 1980)

MINUTES OF THE MEETING, MONDAY, SEPTEMBER 15, 1980

Dr. Donald Fredrickson, Director, National Institutes of Health, chaired the meeting, which was devoted to a review of the tentative agenda for the DAC meeting in October. The participants included those giving presentations at the meeting and commentators from the Federal Government. (See Attachment 1 for the list of invitees.) Dr. Fredrickson opened by noting the importance of the next DAC meeting and therefore the need for this briefing session. He hoped that the issues could be clearly defined so that the presentation and commentary can help elucidate them as much as possible and suggest directions for NIH and the Government to take. He noted the heightened interest and cooperation following the May DAC meeting among the staffs of NIH, the Public Health Service, and the Department in the area of grants and contracts management.

Dr. Fredrickson then turned to the first item on the agenda.

PERSPECTIVES FROM THE OFFICE OF HHS INSPECTOR GENERAL

Mr. Beaudet represented Mr. Richard Lowe, the HHS Inspector General. He briefly summarized the key points Mr. Lowe would cover in his presentation. A brief view of Congressional actions establishing the Office of the Inspector General (OIG) will be provided. The work of the OIG will then be summarized, including the deficiencies identified. Mr. Beaudet reported that NIH grants present much less of a problem with university accounting in terms of fraud and abuse than many of the other HHS programs. The future problems will then be reviewed, including OMB Circulars A-21 and A-110. The latter may significantly increase the cost to the universities, and these issues will need to be addressed. Finally, Mr. Beaudet noted that Mr. Lowe is following a recommendation of the National Commission on Research that a forum be established to discuss all aspects of the Government-university relationship. Mr. Lowe strongly endorses that recommendation. He says there is general agreement that the current cost reimbursement policies are not meeting the needs of either the Government or the universities. Under the auspicies of Mr. Lowe's office, an organization meeting of Congressional, Federal, and university representatives will be held in October to provide such a forum.

Committee Discussion

Mr. Kelly urged that the fixed-price grant be included on the agenda for consideration by the forum representatives, on the basis of the presentations at the DAC meeting. Dr. Fredrickson noted that Mr. Lowe's remarks at the

DAC might focus on the issues, structure, and nature of the forum. The Committee discussion might then be led in a way to be of value at the first meeting of the forum representatives.

MODIFICATION OF THE EXISTING NIH GRANT SYSTEM

Mr. Steven Bernard briefly reviewed the items he would be covering at the DAC meeting. They are in the following three areas: (1) a consideration of options for some form of "automatic" carryover of unexpended balances for all grantees or a class of grants, and the likely impact of various proposals both pro and con; (2) options that would allow grantees under some prescribed circumstances to intermingle funds among "closely related" grants; and (3) possible changes in requirements for expenditures reporting.

Committee Discussion

Dr. Raub questioned whether these three items should have equal weight. Dr. Wilson responded that the first two are of most interest to the research community and that the emphasis should perhaps be there. Dr. Ellis commented that the NSF is attempting to develop better definitions for the "closely related" grants concept. Mr. Bernard noted that, indeed, one of his workgroups is struggling with how to define the concept of closely related grants.

Dr. Wilson asked whether the presentation would be on the basis of science and research policy generally or more on NIH policy needs. Mr. Bernard indicated that the broader philosophical issues would be addressed as well as issues germane to NIH. In concluding the discussion, Dr. Fredrickson said there seemed to be general agreement that the expenditures reporting items should be dropped so that the discussion can focus on the first two items exclusively. Mr. Bernard agreed.

THE FIXED-PRICE GRANT

Mr. Kelly opened by reviewing the concept of the so-called fixed-price grant. (See Attachment 2 for his draft outline.)

Dr. Sol Schneyer noted that the savings may not be very large (perhaps in the neighborhood of 3 percent), and advised that in the discussion on mechanisms, the areas of negotiation should be specified in advance to avoid misunderstanding.

To complement Mr. Kelly's presentation, Dr. Wilson said that she would review the obstacles or problems in implementing the fixed-price grant. She noted first that the name may present problems. The Commission preferred to call it a "grant-in-aid." "Fixed-price grant" has a procurement connotation, suggesting a shift to the monitoring of research output. This would provide problems for the financial managers and auditors in terms of the reimbursement of funds for research--especially when, in their view, the criteria for examining research output are insufficient.

Committee Discussion

Mr. Kelly pointed out that the comments by the Federal financial managers this morning indicated their problems with the cost-reimbursement formula. He noted that PHS grants should have originally been defined as "fixed-price" rather than "cost-reimbursement." Mr. Ellis said he had always assumed that the NSF treats grants as fixed-price, and Mr. Ling seconded this interpretation. Mr. Kirschenmann said that during World War II, cost-reimbursement principles were applied because many of the requirements of the Federal Ggovernment did not permit the cost to be set beforehand. Now the research community is advocating, ironically, the fixed-price concept. Mr. Shoe noted that historically the Office of the General Counsel has insisted on retroactive determination, and that has been the basis for HHS policy.

Dr. Wilson pointed out other impediments to implementing this concept. The impact on indirect cost calculations should be examined, and also the impact on the universities and investigators. Under the present system, the Federal Government, the university administrators, and the principle investigators interact in terms of both direct and indirect costs. With the fixed-price grant, however, the total allocation of cost would be the responsibility of the university and investigator under the grant. Thus, the tensions, now at both the local and Federal level, would be shifted to the former.

Dr. Fredrickson, in summing up, observed that this discussion would be one of high interest for the Committee and all who will be attending the meeting. The presentations should focus on (1) the meaning of "fixed-price grant," (2) the benefits of this grant, and (3) the problems in attempting to implement it. There followed general committee discussion on a more appropriate title, such as "grants-in-aid," "fixed grant," and the like. But for the present, it will continue to be called a "fixed-price grant."

Mr. Beaudet noted that part of the group assembled to create the aforementioned forum would consist of Congressional representatives, since many of these suggestions would require Congressional action. Dr. Fredrickson agreed with the importance of that aspect, but said the emphasis should be on administrative rather than Congressional problems. He stressed the need for a good paper to organize all the commentators and those present in the discussion. Mr. Kelly, following up Dr. Wilson's comments, said that the significance of the fixed-price grant lies in the new relationships it would create in shifting the onus from the Federal Government to the university in the distribution of direct and indirect costs. Mr. Shoe said that a number of obstacles will need to be addressed, and that Mr. Markowitz is preparing a paper and would like to participate in the discussion at the Committee meeting. (Mr. Shoe subsequently called to report that Mr. Markowitz will not have the paper available for discussion at the meeting.)

Dr. Raub as a commentator noted the following. First, that the fixed-price grant relates to post-award rather than pre-award relations--to dollar allocation rather than peer review; and that one must clarify this from the beginning so that all will understand the distinctions here. Second, focus will be on how an experiment might be conducted to test this mechanism. At present, it is not clear how this could be done. Dr. Fredrickson, in response, noted that the thrust should be, Let's try an experiment and if not, why not. Mr. Kelly advised that in order to conduct an experiment, the following should be observed: (1) several institutions should participate; (2) the experiment should be done with both small and large institutions; and (3) all NIH awards to those institutions should be included. Mrs. Schroeder noted the importance of distinguishing in such an experiment between the research project grant and the centers and resources grants in terms of reimbursement mechanisms. And Mr. Kirschenmann advised that in setting up the experiment one should first define what we would expect or hope to achieve. There was general concurrence with these recommendations.

THE ORGANIZATIONAL GRANT

Dr. Sherman opened by reviewing the history and current state of the biomedical research support grant (BRSG). (See Attachment 3 for his draft paper.) In opening the committee discussion, Dr. Fredrickson commented that Dr. Sherman is advocating this instrument. He noted that the grant seemed to be favored more by the Congress than by the Department or the OMB. Mr. Kelly pointed out, however, that it was Secretary Folsom who gained support for this grant mechanism (as well as for the establishment of the National Institute of General Medical Sciences).

He then added that in evaluating the BRSG, one should examine the original goal that was not met--namely, support for the young principal investigator. He said that a number of mechanisms, such as research fellowship, have been created to foster support for the PI and that perhaps we should consider amalgamating the several mechanisms to achieve this goal.

Dr. Fredrickson also suggested that Dr. Sherman might compare the original guidelines that governed these awards with the present ones, which are far more stringent. Dr. Sherman agreed to do so. Mr. Kelly also observed that in the initial evaluation of the BRSG, Congressional examination focused on the use of this mechanism for funding grants that were reputedly rejected under the peer review system. Dr. Sherman said that the program encountered difficulties more through lack of vigorous support by the principle investigators. Mr. Kelly asked how strongly the Institutes support BRSG. Dr. Fredrickson said that there is support, but it is not directly linked to the missions or programs of the individual Institutes.

Dr. Merritt remarked that the BRSG mechanism can support innovative research proposals. In effect, it can be a safety net for them and might allow for small pilot studies.

SLOAN-KETTERING MODEL

Dr. Herman provided a historical perspective on the development of the grant to Sloan-Kettering Institute and the ultimate fate of that award. (See Attachment 4 for his draft paper.)

In commenting on Dr. Herman's presentation, Dr. Fredrickson said that the grant never was evaluated for its effect on science, but was terminated more because of Legislative and Executive Branch considerations about legislative authority and its implementation. Mr. Kelly said he had originally opposed this award--that it had succeeded because it was given to an outstanding institution, but it was dangerous. The Department of Education, he continued, once used such a model to create regional educational centers that had been difficult to terminate. In his view, the project grant individually ranked under the peer review system is far easier to justify and monitor than the block type. He then asked whether this grant led to the creation of NCI's Cancer Center program. Dr. Fredrickson responded that in effect the Centers are slowly changing to a center core embracing R01s and P01s obtained as usual through the peer review system. Finally, Dr. Fredrickson suggested that Dr. Herman try to focus on the use of the instrument generically rather than on the special connection with Sloan-Kettering. He also noted that Dr. Ling will serve as one of the commentators. Dr. Ling has reviewed NSF organizational grants, publishing his results in last week's issue of Science. (See Attachment 5 for that article.) He mentioned that his comments would reflect on the study conducted for NSF and the DOE.

PERSPECTIVES ON INDIRECT COST

Dr. Fredrickson opened by noting that this was a followup to the discussion on indirect costs at the last meeting. Here, we would like to know how NSF and PHS apply the rates to the institutions and especially how these agencies differ in doing so.

Dr. Wilson said it would be important to discuss the key concern of Dr. Brown--that indirect costs, negotiated annually, reflect inflation, whereas direct costs have no mechanism for taking inflation into account.

There was general discussion on the issues of how NIH handles direct and indirect costs as opposed to NSF, under cost-reimbursement and fixed-cost principles. It was agreed that the system for both is hybrid, but that NIH is closer to the cost-reimbursement principle and NSF to the fixed-price principle. Dr. Fredrickson concluded by asking Drs. Ellis and Shoe if they could work out an agreement to highlight the differences between the two agencies, perhaps using a slide or a "diagram distributed before the meeting.

Dr. Fredrickson then called on Dr. Ebel, who will present the University of Wisconsin procedures. Dr. Ebel noted that the agenda says "university procedures" and should more correctly state "University of Wisconsin procedures." The agenda, it was agreed, would be changed. How universities operate, he said, depends in large part on their system of governance and their budget structure--that there are great differences in terms of how to handle these kinds of issues between, for example, public and private institutions. He noted that, beginning in 1971, the University of Wisconsin began to address the issue of indirect cost rates because, as they increased, principal investigators became concerned. Steps were taken to educate the PIs and to set up advisory committees that address these issues and, more recently, focus on how to comply with OMB Circular A-21. Dr. Fredrickson commented that

Dr. Ebel's presentation would be most instructive to the Committee, especially in light of discussions at the last DAC meeting.

CONCLUSIONS

Dr. Fredrickson then briefly summarized the second day's agenda, which will focus on (1) new HHS debarment regulations, (2) NIH grant policies concerning commercial organizations, and (3) NIH training trends and policies. He concluded by requesting that all presentors send papers by October 1 to Dr. Perpich, who will then prepare briefing books and distribute them to all commentators and participants at the meeting. He urged that the presentors get in touch with the commentators so that there can be as much preparatory interchange as possible. Dr. Fredrickson concluded with the hope that the meeting would be able to provide advice to NIH, the Department, and more generally, the Government and the Congress on policies that might reduce the friction between the Government and the universities. The meeting was adjourned at 11:30.

Respectfully submitted,

Joe Perpich

Joseph G. Perpich, M.D., J.D.
Associate Director for
Program Planning and Evaluation

5 Attachments

Attachment 1

Advisory Committee to the Director, NIH

BRIEFING MEETING

September 15, 1980

Attendees

BEAUDET, Raymond
Associate Director
Division of University and Non profit Audits
Office of Inspector General Audit Agency
Department of Health and Human Services

BERNARD, Steven C.
Office of Extramural Research and Training, NIH

DOUGLASS, Carl, Ph.D.
Director, Division of Research Grants, NIH

EBEL, Marvin E., Ph.D.
Associate Dean, Graduate School
University of Wisconsin

ELLIS, Gaylord L.
Director
Division of Grants and Contracts
National Science Foundation

HERMAN, Samuel S., Ph.D.
Associate Vice President for Research
Temple University

KELLY, James
Executive Vice Chancellor (Retired)
State University of New York

KIRSCHENMANN, Henry G., Jr.
Director, Office of Grant and Contract Financial Management
Department of Health and Human Services

LING, James G., Ph.D.
Director, Program Implementation Division
Office of Energy Research
Department of Energy

MERRITT, Doris, M.D.
Special Assistant to the Director, NIH

RAUB, William F., Ph.D.
Associate Director for Extramural Research and Training
National Institutes of Health

SCHROEDER, Helen
Assistant Policy and Procedures Officer
Office of Extramural Research and Training, NIH

SHERMAN, John F., Ph.D.
Vice President
Association of American Medical Colleges

SHOE, Thomas
Director
Division of Contracts and Grants
Office of Research Management
Public Health Service

WILSON, Linda S., Ph.D.
Associate Vice Chancellor for Research
University of Illinois

October 2, 1980

Agenda
41st Meeting of the Advisory Committee to the Director, NIH

October 20 and 21, 1980

Building 31, Conference Room 6
National Institutes of Health

FEDERAL SUPPORT FOR HEALTH RESEARCH:
NIH Funding Mechanisms and Policies

MONDAY, October 20

Morning Session

8:30	Introduction and Overview	Dr. Fredrickson
9:00	Perspectives from the Office of HHS Inspector General	Mr. Lowe
9:30	Committee Discussion	
10:00	Modification of the Existing NIH Grant System	Mr. Bernard
10:30	Coffee Break	
10:45	Committee Discussion	Dr. Thier Mr. Kirschenmann Dr. Eckstein Mrs. Hoppin
11:30	The Fixed Obligation Grant	Dr. Wilson Mr. Kelly
12:00	Committee Discussion	Dr. Temin Dr. Raub Dr. Anlyan Mr. Fuller
12:45	Lunch	

Afternoon Session

1:45	The Organizational Grant	
	• The Model of the Biomedical Research Support Grant (BRSG)	Dr. Sherman
	• "Sloan-Kettering" Model	Dr. Herman

2:15	Committee Discussion	Dr. Shaw Mr. Ling Dr. Nicholson Dr. Benacerraf Dr. Kabat
3:00	Coffee Break	
3:15	Perspectives on Indirect Costs	
	• Federal	Mr. Markowitz Mr. Ellis
	• University of Wisconsin Procedures	Dr. Ebel
4:00	Committee Discussion	
4:30	Perspectives from the Office of Science and Technology and Policy	Dr. Prager
5:00	Committee Discussion	
5:30	Adjournment	

TUESDAY, October 21

Morning Session

9:00	Introduction	Dr. Fredrickson
9:15	New HHS Debarment Regulations	Mr. Riseberg
9:35	Committee Discussion	
10:10	NIH Grants Policies re Commercial Organizations	Dr. Raub
10:30	Coffee Break	
10:45	Committee Discussion	
11:15	NIH Training Trends and Policies	Dr. Douglass Dr. Merritt
11:45	Committee Discussion	
12:30	Committee Adjournment	

ADVISORY COMMITTEE TO THE DIRECTOR

Minutes of the 41st Meeting
October 20-21, 1980

FIRST DAY: OCTOBER 20

The 41st meeting of the Advisory Committee to the Director, NIH, (DAC) was held at the National Institutes of Health, Bethesda, Maryland. Dr. Donald S. Fredrickson chaired.

Introduction and Overview

Dr. Fredrickson opened by stating that the meeting would follow up on the issues raised at the DAC meeting of May 13-14 devoted to the topic "Health Research in Educational Institutions--Costs and Accountability." This meeting narrows the focus on Federal support for health research to possible NIH funding mechanisms and policies. Dr. Fredrickson said that several of the presentations would be addressing improved ways of dealing with research costs and accountability issues. He noted the importance of these issues to the Government and the scientific community. Increasingly one hears how Federal agencies are constraining university research work and progress.

Dr. Fredrickson related that in a recent speech in New York he had cited Clark Kerr's observation (1964) that there were two great impacts of the Government on universities over the previous hundred years--namely, legislation establishing the land grant schools and, during World War II, a major Federal commitment to fund research in the universities. Both of these actions, Dr. Fredrickson believed, were expressions of strong popular intent to have the universities be utilitarian and egalitarian. Now, however, mounting Federal intervention seems to be at cross purposes with this ideal. With increasing Federal dollars, especially, have come increasing regulations. Thus, there are shifting frames of reference, with much greater stress on fiscal responsibility, and the universities are burdened in many important areas through requirements for institutional review boards, biosafety committees, and so forth.

NIH has attempted to mitigate onerous restrictions by assisting in establishing national standards and delegating the responsibility for enforcement and monitoring to the local institutions. In the area of accountability, however, it is clear that much more has to be done by both the Federal Government and the universities to get all relevant parties to discuss the issues--on the Federal side, the program managers and auditors, and on the university side, the administrators and faculty. It is essential that there be a better all-around understanding of the Federal policies on auditing and the nature of research and its institutions.

This is critically important because of the changes occurring in regard to Federal support. The NIH budget is leveling off, and it is ironic that this comes at a time when the fruits of the Federal investment over the past 30 years are tumbling out faster than they can be handled. Some fields, of course, are moving much faster than others, but how to deal effectively with research opportunities and leveling of funds is a creative challenge for the Government and the scientific community. In several areas, notably genetics and immunology, the deficits in trained people to handle the applications and cope with the advancements will increase unless there is steady support for scientists.

Dr. Fredrickson, in concluding, lauded the splendid forum provided by the last Director's Advisory Committee meeting, including the consultants who had contributed significantly in defining the issues of accountability and research. The stress will now be on ideas and how things might be changed to deal with (in Jim Kelly's phrase) "accounting and accountability." Then Dr. Fredrickson turned to the first speaker, Mr. Richard Lowe, the Inspector General (Designate) of HHS.

Perspectives from the Office of the HHS Inspector General

Mr. Lowe stated (see Attachment A) that in 1979 there were 1,500 audit reports. These identified some $188 million in recommended financial adjustments, of which about $14 million related to institutions of higher education. In addition, the universities had claimed $187 million in costs that were not supported by accounting or other records required by Federal regulation. As a result, these amounts had to be set aside for negotiation between program and university officials.

Committee Discussion

Dr. Howard Temin inquired how much of the $14 million and the $187 million related to NIH grants. Mr. Lowe reported that most did. Dr. Temin also asked for estimates concerning the costs of the audit agency that is part of the Office of the Inspector General. Mr. Lowe said he didn't have those figures readily available but could provide them to the Committee. As to the cost of auditing, approximately four dollars are collected for each dollar spent. He acknowledged that this is an average figure; clearly, the components might be different for an audit of the Health Care Financing Administration's funds versus those of NIH. He also emphasized that the creation of the Department of Education has not resulted in a transfer from his office of the auditing functions for research grants.

Dr. Ramey pointed out that auditing problems frequently arise concerning support of students from research grants. She asked why these costs were not allowable. Mr. Lowe explained that the basis for disallowances here include the fact that students receive Federal fellowships and other Federal support--that if support from research grants were allowed, the universities might appear to be double-billing the Federal Government. He stressed that his office is responsible for implementing the regulations, but that he is not directly responsible for the underlying policies. These are just the kinds of issues, Mr. Lowe noted, that need to be pursued in a broader forum as recommended by the National Commission on Research. Mr. Lowe emphasized his support for such a forum as a means to bring out new ideas and perhaps more effective solutions to a number of the long-standing problems between the Government and the universities. It is a high priority of the Department, of OSTP, and of the Vice President that such a forum be convened. Dr. Ramey responded to the effect that, in her view, the Government is getting two benefits from supporting these students: not only are scientists being trained, which is a Federal objective, but research itself is being furthered.

Dr. John Sherman commented that the AAMC and other associations have discussed the approaches taken by different agencies to the interpretation and implementation of OMB Circular A-21. He asked whether Federal policies regarding its implementation could be coordinated. Mr. Lowe replied that there are monthly meetings of all Federal Inspectors General and that the implementation of A-21 is a key issue on the agenda. However, the forum may be a better approach for consideration of A-21 in the broader context of Federal policies and regulations regarding the universities.

Henry Kirschenmann spoke briefly about the responsibilities of his office, which receives the audit reports and attempts to settle the exceptions raised by the auditing staff of the Inspector General. His office works closely with the Department of Defense and other agencies to coordinate interpretations of OMB Circular A-21; and indeed, Defense, HHS, NSF and the OMB now agree on the approach. In addition, copies of audit reports from HHS are sent to all the agencies so that they will get a better sense of how the circular is being interpreted. Mr. Kirschenmann also addressed stipend policies. Historically the Federal position has been that research grants should not be charged for student aid. He noted that the term is now confused because the universities use it as a rubric for any kind of financial aid to students. He added that OMB Circular A-21 now permits the work of students on a grant to be charged to the grant where payment is conditioned upon the performance of the work.

Mr. Kelly spoke to the $187 million in claims cited by Mr. Lowe. That figure, he pointed out, was only about 6 percent of the total current NIH expenditure. Why, then, is it necessary to spend a good deal of time trying to improve the system for monitoring the university's disbursal of NIH funds? Indeed, it is questionable in the sense that the order of magnitude is out of proportion to the problems created. Out of the $187 million claimed, the net resolution will be close to zero. Mr. Lowe responded that this $187 million represents claims of universities beyond those supportable by their audit records or accounting systems. He wanted to emphasize that he wasn't saying these universities hadn't spent the money, only that they can't account for it for purposes of Federal support. This, he said, is the core of the problem: accounting requirements must be sufficient to support university claims.

Mr. Kirschenmann noted that over the past 12 months his office has received 200 audit reports concerning serious auditing deficiencies. Eighty or ninety percent involve universities, and 90 percent of those relate to time-and-effort reporting. He said that more than 100 of these reports were settled finally between the Government and the universities. Therefore, it is important not to magnify the problem with discussions between the Government and the universities; one must keep in mind that settlements can usually be reached.

Mrs. Margery Hoppin observed the following points concerning these set-asides cited by Messrs. Lowe and Kirschenmann. Basically, the rules have been the same since the '60s, but now, the Federal auditors are setting more rigid interpretations. Accordingly, the universities must now spend thousands of dollars in order to comply. Dr. Stuart Bondurant suggested that perhaps agreements reached between the Government and the university are not based so much on satisfaction by the latter as on acceptance of the inevitable.

Mr. Kirschenmann noted that OMB Circular A-21 as newly revised is an important step to reduce the burdens on the universities. Before, time-and-effort reporting was required on a monthly basis; now it is on a semester basis. He noted, however, that the universities continue to ask for monthly rather than semester reports. Dr. Bondurant said that the university may want to prevent retroactive disallowances that have been occurring over the past decade. Mr. Kirschenmann believed that such disallowances would not occur if the newly revised A-21 procedures were followed.

Dr. Linda Wilson pointed out that the National Commission on Research examined a case of one university's set-aside problems. It involved a university where between $15 and $50 million was set aside on the basis of audit reports. In examining the audit reports, however, it was clear that the set-aside could be resolved with better information. She expressed concern that Mr. Lowe in his speech, while urging more cooperation, had raised the questions whether wrongdoing by researchers was "just an isolated incident or the tip of an iceberg." The statement, she said, suggests that greater monitoring surveillance by the Federal Government might be needed to uncover whether there is more fraud and abuse than appears to exist. Mr. Lowe denied that that was his intent. His figures showed, as stated in his speech, that there is no major problem of fraud and abuse among the universities. It was important to recognize, however, that his office was statutorily created by the Congress, that he must report not only to the Secretary but to the Congress as well, and that their interest is in ensuring appropriate spending of Federal funds. Thus, the key concern is to maintain the highest fiscal standards for Federal expenditures.

Dr. Fredrickson thanked Mr. Lowe for his presentation and added that it was an excellent overview and set the stage for the entire day's proceedings.

Modification of the Existing Grants System

Mr. Steven C. Bernard's presentation is provided in Attachment B. His conclusions, which he said at this point were only recommendations of NIH's Grants Management Advisory Committee, are as follows:

1. That there be no changes regarding NIH/PHS policy on carryover of funds. The reason is that the use of unobligated balances as funding offsets (deductions) allows NIH to award several hundred additional grants each year. He also said there are no hard data regarding requests for carryover, but in a brief survey of grants management officers, there seems to be general agreement that approximately 10 percent of all grantees request carryover and that approximately half of those requests are approved. Thus, the present system does allow for carryover if judged to be warranted, but not on an automatic basis.

2. That present NIH/PHS procedures be expanded somewhat to permit intermingling of funds other than just salaries between "closely related" grants. There seems to be a general consensus, however, that the number of projects identified as closely related for purposes of the intermingling of funds would not increase significantly.

Committee Discussion

Dr. Fredrickson opened the discussion by commenting that Mr. Bernard had presented a careful account of possible fine-tuning in the NIH system for the management of grants. Concerning the carryover provision, Dr. Fredrickson said he frequently speaks with university officials who ask why NIH does not provide more support through instruments like the organizational grant. He noted the savings NIH achieves that permit additional funding for research project grants, stating that this is especially important now that NIH is committed to funding a minimum of 5,000 new grants each year--a commitment that has strong Congressional and Administration support. In terms of transfer, the key problem here is institutional versus research project funding. The highly categorical structure of NIH has worked well, especially in Congressional and Administration relations, but the tension with the university derives from this system, especially in post-award accounting. These are key management issues for NIH and the community it serves and supports.

Dr. Samuel Thier, commenting on Mr. Bernard's paper, agreed that it was good policy to preserve the carryover in order to fund new grants and suggested that this could form the basis of an incentive system. For example, if it appears that NIH can recoup a 2 to 3 percent savings, then perhaps those savings could be increased to 5 percent by telling the investigator that 2 to 3 percent of that would automatically be used for carryover and the remainder to fund new grants. Such a policy would induce the investigator to be more economical. In addition, there clearly should be some form of automatic carryover for the longer-term grants, such as those running 3 to 5 years. Here, inflation takes a special toll. Just to keep up with salary support alone is providing fewer dollars from the grant for equipment and supplies, and this latter category seems to be even more ravaged by inflation than other sectors of the economy.

Dr. Thier then commented on the question of intermingling of funds. He noted that a decade ago the policy was to push for program project grants and centers because these instruments seem to encourage interaction among researchers and disciplines. Now the focus is shifting more to support for research project grants because of the fiscal pressures from the leveling of funds and resources. Thus, the issue today is how to use the project grant and yet provide for continued exchange among the scientists.

Another consideration is the shift in relationships that accompanies the shift in type of grant. With the research project grant, the relationship is more between the investigator and NIH, whereas the center and program project grants favor interaction between the principal investigator and his or her institution.

Mr. Kirschenmann commented that a large part of the audit disputes center on the relatedness issue, which is something that must be dealt with adequately. In his view, it is a program call rather than an auditing call. Basically, accounting will follow the intent of the program managers.

In responding to Dr. Thier's remarks, Dr. Fredrickson asked what the effect on the young investigator would be if intermingling of funds and transfer among grants were permitted. Would this create problems for the young investigator with his or her institution? Dr. Temin replied that basically it depends very much on the institution, the senior investigator, and the young investigator's relationship with both. It could either help or harm, depending on those relationships. Dr. Carlos Eyzaguirre noted that the young investigator must have independence, but also that the collaboration at his or her institution is most important; and Dr. Hansen commented that independence is essential, but that there are advantages to sharing a facility's resources. Dr. Elvin Kabat seconded that, noting the importance for the young investigator of cooperation and collaboration, especially in the use of scientific instruments and the like.

Dr. John W. Eckstein, commenting on Mr. Bernard's paper, stressed that the proposals and recommendations were sound and sensible. The key here must be on permitting the maximum degree of flexibility, not only for the young investigator and the institution, but for NIH as well. Dr. Wilson noted that most of the transfers at the university occur for salaries, and she noted the special problem for the universities where they must pay the salaries while waiting for the award notices to arrive. It is in these circumstances that the transfers often occur. Much thought has gone into this, particularly at the National Science Foundation, and clearly, NIH should consider as a first step the one investigator with many projects as a way to begin the concept of transfer. But the key problem is that many investigators have monies from different agencies with different projects--from different components of NIH, for example--and for different fiscal years. These all have to be carefully examined. Concerning the problem of the young investigator, there must be mechanisms at the institution that would protect the integrity of the investigator and protect against abuse in funding; but more thought must also be given to the question of how to permit the necessary flexibility to counter the increasing compartmentalization of science that prevents intellectual stimulation among disciplines. New approaches are needed here.

Mrs. Hoppin, in commenting on the paper, felt that cost transfers should be encouraged. There should be increased creativity and efficiency, and what is important here is not to focus on the process but on the research results. The investigator needs flexibility for transferring funds. There are rules for advance notice and possible transfer, but they are obscure and the disputes will continue. She said that we really don't need a definition for relatedness as had been suggested earlier, that all know what it means. Auditors and program managers are making decisions in parallel, and there needs to be greater coordination here to achieve some sensible results.

Dr. Fredrickson said the focus should first be on the investigator with several instruments of support. Dr. Denis Prager said we should be considering here what is happening in other parts of the Federal Government where, particularly in the regulatory area, performance standards are set and then the means to achieve them is left to the representative parties, including industry. He noted that we seem to be taking the incentive away from the principal investigator to use the funds most efficiently for research. The present system, in effect, requires the investigator to use or lose the funds--that is, to spend them before the grant is up or turn them back. Thus, we must think again about the goals and provide incentives for the institutions to achieve them.

Dr. Hansen said that the figure of 2 percent as last reported by Mr. Bernard will probably reflect the lowest error rate by the investigators as a margin for not overspending on their grant. She endorsed Dr. Thier's concept of taking a fixed amount at the "front end" of the grant, which would then perhaps permit automatic carryover with yet additional funding for a new grant.

If this were done, then the investigator would not need to dump funds at the end of the grant period, but would have an incentive to carry them over.

Dr. Temin remarked that inflation is driving the costs of research up significantly, especially in terms of research materials. Thus, the investigator must turn increasingly to supplemental grants. He noted that some of the new grants funded from the 2 percent as defined by Mr. Bernard might be supplemental grant requests and not additional funds. On the question of relatedness, he said that the test should be the intent of the principal investigator as the best approach, rather than adherence to some standard definition. Dr. Wilson commented that she has been working with the National Science Foundation on the question of cost transfers. Discussions have focused on transfers involving the same discipline and different disciplines and on the areas of applied and developmental research. But she felt that a lot more thought has to be given to the way the Federal Government deals with administration of grants once they are awarded, and that the Government must accept a certain margin of error with the fuzziness in the system that seems requisite to good research.

Dr. Marvin Ebel commented that relatedness in science really encompasses all of science. There should be a presumption of relatedness. Also, the young investigator can be hampered by lack of complete independence. Because of the way science is now organized, cooperation and collaboration are essential.

Mr. Bernard, in summing up, stated that the discussions focused on the desire to accommodate automatic carryover while providing full reimbursement for indirect costs and at the same time funding more grants, but that it is impossible to do all three with the present budgetary restraints. It may have been possible when virtually 100 percent of approved applications were funded, including grants with priority scores of 400 (on a scale of 500 up to 100), but those days have passed. At present, the cut-off point for funding grants is considerably lower. Thus, the question is whether one should more fully fund smaller numbers of grants or provide for a larger base of grants which is achieved, in part, through the use of unobligated balances. He also commented that NIH is the only agency that pays full actual indirect costs by permitting post-award-period adjustments. And finally, he noted that in regard to the concept of relatedness, it is primarily, in his view, the administrators and department chairmen who attempt to make these after-the-fact determinations rather than the principal investigator.

The Fixed Obligation Grant

Mr. Kelly presented the material that he and Dr. Wilson had provided to the Committee. (See Attachment C, from Mr. Kelly's outline and Dr. Wilson's paper.) He outlined the problem, the objectives, a possible solution, preconditions to fixed obligation grants, the mechanics of such grants, and related surveillance changes. He pointed out that the initial figures the authors had for savings from carryover funds which were used for new grants was 1.4 percent. However, the new figure from Mr. Bernard of 2.4 percent is a very significant savings, equivalent to approximately 700 grants. Therefore, a prediction of savings is needed that can be set in place and taken out of the front end, as suggested by Drs. Thier and Hansen in the previous discussion.

In concluding his comments, Mr. Kelly noted that the issue here is to distinguish accountability from accounting. A fixed obligation grant, he believes, would simplify accounting while not changing the required accountability standard.

Dr. Wilson emphasized the key points in her paper that must be kept in mind. They are (1) whether basic research can be most effectively pursued as assistance or procurement; (2) whether the costs and benefits of the reimbursement process make it a necessary choice for all Federal-supported research in universities; and (3) whether modification of the terms of the research agreements could help improve the relationship while still meeting accountability and support objectives.

Committee Discussion

Dr. Temin, commenting on the paper, stated that he favored the proposal generally, but had a number of questions. What is the purpose of changing to the fixed obligation grant? Will it increase productivity? Will it reduce the friction between the Government and the universities regarding post-award audit? Are there savings? Will these changes meet the fiscal accountability, the demands of Congress, and the public? He wasn't clear whether this would affect Congressional views. Finally, he noted that under the fixed obligation grant the tension would no longer be between the Government and the university so much as between the principal investigator and the university. A key consideration would be how the principal investigator is to keep his fair share? That is, what is to prevent the university from arbitrarily taking more and more out of grants for indirect costs, which it would no longer have to negotiate with the Government but would set on its own terms.

Mr. Kelly, in response to Dr. Temin's comment, stated that NIH would have to conduct a trial (not really an experiment) testing modifications of the administrative procedures to find out if there are any hurdles or obstacles to implementation of the fixed obligation grant. Further, Mr. Kelly said that he believes the Congress would not object to this approach and, indeed, might support it. The issue, in his view, has never been presented to the Congress, and he pointed out that the Congress has historically supported NIH management. In his view the key person to persuade here is the Comptroller General, Elmer Staats. From his perspective he would think Mr. Staats would be very receptive to this approach. The Federal Government might have problems, Mr. Kelly thought, because the administration of the funds would be delegated to the university and there would be less opportunity to recoup dollars. Basically, he said, the approach would not change the dollars to the institutions, would not diminish the number of projects, and would not impact on fraud and abuse, which is minimal here in any case. He acknowledged that, indeed, there might be a redefinition of faculty administrative roles; but in his view, that was another advantage to this broad approach, because it would require better faculty and administrative cooperation. Mr. Kelly added as a footnote that in terms of savings, the national average would have to apply (and would be sensible here), for the present system is not as refined in terms of accounting as many believe.

Dr. Wilson pointed out that under the fixed-price grant the investigators investigators have a safeguard. The pre-award process is the peer review system, as under the present mechanism. And that, in effect, is a compact between the investigator and the institution on the cost for the grant.

Dr. Anlyan, in commenting on the papers, opened by noting the positive benefits of having the DAC meeting in May and this particular discussion now. He emphasized again his concerns, expressed at the last meeting, that OMB Circular A-21 will add additional expenses to the university in terms of compliance, but that it is only another of scores of Federal regulations that set a regulatory climate today for the researcher at the bench. He observed on a recent trip to Japan that there was far more government, university, and industry cooperation in solving problems.

He would endorse a trial of the fixed obligation grants proposed by Dr. Wilson and Mr. Kelly. He suggested selecting perhaps five institutions where that approach might be taken and five to serve as controls. Or half of the grants at ten institutions could be approached in this manner. The criterion would be whether the innovation serves as an incentive for increasing research productivity.

Mr. Peyton Fuller, commenting on the papers, said that the approach has merit. He stressed that we must attempt to focus on how well the research was done rather than on the process for supporting it, which marks the current system. Audit should not be on a grant-by-grant basis but rather on the institutional control system. Concerning fraud and abuse, he noted that gross abuse sponsored by the institutions is so remote that it is simply not a major question. At the lower levels where there may be fraud, grant audits will generally not catch it anyway, but the internal system of control may. Once again, here is where the audit should lie. He endorsed the concept of cost transfers, noting that at present the grants are not adequate to meet inflation and that the principal investigator must either go back for supplemental support, reduce the scope of work under the grant, or juggle internally through cost transfer.

Dr. Raub, in his comments on the proposals, noted that there are a number of conceptual hurdles to be faced. For example, one would not want to introduce procurement aspects into the traditional grant relationship. Currently the stress is on dollar accounting rather than on producing a prescribed research product. In the fixed obligation grant, the center of gravity shifts from cost accounting to performance accountability. Thus, it removes the burden on cost accounting but introduces a new burden on performance; and the performance measures and procedures now in use are not likely to be acceptable as full substitutes for cost accounting measures. The peer review system, he acknowledged, is an excellent way to measure scientific performance over intervals corresponding to the term of an individual grant (3-5 years), but entirely new concepts and procedures would be needed if there were to be year-by-year performance appraisals of each grant over and beyond that which agency staff already do. There is a significant risk that the trade-off of more performance accountability for less dollar accountability might be gained at the cost of reducing scientific freedom.

Dr. Prager commented that one of the problems that he has heard discussed throughout the meeting is the impact of inflation on research. He observed that many salaries are indexed to inflation, creating a vicious cycle for more inflation. Hence, prospective budgeting is an attempt to produce incentives to keep inflation down. The VA is trying to use this system in terms of its health care, and basically the fixed obligation grant would be a similar approach. He believes it has a great deal of merit and should be tried.

FIRST DAY--AFTERNOON SESSION

The Organizational Grant

Dr. Sherman presented an overview of the "Biomedical Research Support Grant (BRSG)" concept. (See Attachment D.) He stressed the declining general support. His data showed that the BRSG, which attained a level of $60 million in the late '60s and early '70s, provided significant support for salaries and equipment, pilot research projects, and indeed, new principal investigators. In terms of personnel supported, a large component was for students and technical assistants. He pointed to the vast discrepancy between the program level and the authorization (15 percent of funds available for NIH research grants) in more recent years.

Dr. Fredrickson commented that Dr. Sherman's presentation demonstrated one kind of flexible institutional support, noncategorical, which is administered at NIH by the Division of Research Resources. He noted that this program is on the knife edge of a philosophical consideration about Federal support for research. It has been widely debated in and among the Congress, the OMB, the Department, and NIH. At present, support for the program might lie in the emphasis that the Office of Science and Technology Policy is giving to renovation of the physical plant at the research universities. The need for renovation is very much on people's minds. Dr. Fredrickson said he hoped the BRSG guidelines could be modified so that the grants could be used for those purposes.

Dr. Samuel Herman then provided an overview of the "Sloan-Kettering organizational grant," which is included in Attachment E.

Committee Discussion

Dr. Shaw, in commenting on both presentations, characterized the BRSG approach as one of research supplementation on a formula basis whereas the Sloan-Kettering model is direct research support and provides more flexibility. But why look for alternative mechanisms to the research project grant and the peer review system? In her view, we need to consider how to use the existing mechanism of peer review to enhance accountability. She suggested a number of possible approaches, such as examining the principal investigator's past accomplishments. Perhaps there could be innovations, such as peer review of the scientific output and reports from investigators on their particular contributions to the work cited in publications--demonstrating, in fact, who did what. She approved of the fixed obligation grant approach and endorsed the concept of allocating the savings at the front end, with an incentive for savings at the other. This, in her view, is preferable to the organizational grant. She also proposed that we have a system for accounting comparable to the peer review system for science. In her view, the priority score on a grant should reflect not only the quality of the investigator but also of the institution.

Dr. Ling's study performed on Materials Research Laboratories (MRLs) for the National Science Foundation appeared in Science magazine (see Attachment F). The study compared MRLs funded with institutional grants with those funded on a project basis. Dr. Ling briefly reviewed the study and the conclusions: Laboratories funded institutionally (1) appeared to have a greater number of major achievements, (2) attracted better-known researchers; (3) involved much less total administrative cost per grant dollar, and (4) tended to stress evaluation of accomplishments in contrast to proposal evaluation. Dr. Ling noted the differences in these institutional grants from those described by Dr. Herman. For example, unlike the Sloan-Kettering, the MRLs could get additional funding from Federal agencies and annual adjustments in the grant. Further, the grant did not disrupt university administration. Site visits were conducted in order to ensure high scientific merit, and there was internal competition among the center directors. The organizational grant provides stability and is especially useful for acquiring and sharing equipment. In conclusion, Dr. Ling stated that there is need for both the organizational and the research project grant. The key issue is to decide on the optimal mix.

Dr. Nicholson spoke briefly on the suggestions Dr. Shaw had made, stating that NSF is coincidentally trying to implement some of them. Two experiments are now under way in which there is a trial for extending three-year grants in chemistry for especially creative investigators. The program officers have the opportunity to select 10 percent of their grantees and extend the grants for two more years without a new proposal. The selections are made on the basis of grantees who, through their publications, have demonstrated exceptional productivity and creativity. And another experiment involves renewal of a standard three-year grant, where investigators have the option of submitting reprints with brief comments on future directions to provide the basis for the peer review that determines whether the grants are to be extended. Thus, NSF is really trying to enhance the peer review process to meet the needs of the most creative investigators and reduce the administrative and paperwork burden.

Dr. Nicholson then went on to describe briefly the NSF master grant in the chemistry division. Once grants have been awarded, they are aggregated and treated as one administrative unit--as if they were a single grant to a chemistry department. There are single account numbers and the like, producing real administrative efficiency. Moreover, there is a good deal of flexibility, with maximum delegation to the institution of authority for approving budget deviations and cost transfers among projects in the aggregated pool. Further, there is a provision for pre-award costs of up to 90 days. The NSF is currently examining how this approach might be generalized, which touches on the issue of relatedness as discussed in the morning session. Dr. Shaw asked whether the transfers among the grants are by the principal investigator or the senior faculty administrators. Dr. Nicholson replied that the principal investigator always is the person who initiates any changes.

Dr. Kabat, in commenting on the papers, spoke to an essential concern of his--the escalating indirect cost rates and their impact on whatever research mechanism is being used by NIH. He cited the escalating rates at Columbia University that have made it increasingly difficult for him to complete the research work envisioned in his grant proposals. He is required to ask for supplementals and spends a good deal of time attempting to do his research work and meet the competing indirect cost demands.

The key issue is salary, which is also central in the accounting process for time-and-effort reporting. He has proposed in the past, and proposes again, that the Government provide money to endow research chairs, freeing salaries from the research grants. The university, he believes, should try to match the funds on a one-for-one basis from private sources. These matched chairs could also go to nonresearch areas, such as the humanities. He said the endowment of chairs is especially important because the peer review process, with inflation and leveling of NIH budgets, tends to trim research grant budgets because salaries must be paid. It may come to the point, he said, where the grant will provide the salary but there won't be any money left to fund the work. And he further noted that as support declines for research, it levels off for research grants, while indirect cost rates continue to rise and compete with grants.

As a substitute for rising indirect costs, a fixed fee to the institution for the services of its tenured professors involved in research should be instituted. This would not be considered as reimbursement for salaries, but as an Institutional Grant, and probably should not include indirect costs. This is an interim alternative to capital grants for endowed chairs.

Dr. Kabat concluded by illustrating the escalating indirect cost rates at his institution, which have risen from 38 percent in 1968 to 55 percent in 1974 and to a projected 68 percent for 1981. Dr. Fredrickson said that Dr. Kabat's comments lead directly into the next discussion.

Perspectives on Indirect Costs

Mr. Shoe reviewed the processes for indirect cost rates at HHS and NSF. (See Attachment G for background material.) In both systems, universities must have an established indirect cost rate in order to be reimbursed. HHS generally establishes the indirect cost rates for most universities, and these rates are then used by all relevant departments and agencies. All proposed indirect cost rates must meet the OMB Circular A-21 requirements. Additionally, HHS requirements call for an adjustment between the beginning estimatesand the final accounting. While there are several types of indirect cost rates, the two main types are: (1) the predetermined fixed rate where no adjustment is permitted, and (2) the fixed rate with carry-forward provisions for variations between provisional and actual audited costs. Rates for each institution are established through negotiation with HHS and are formalized through a negotiation agreement.

Comparing the systems of the two agencies, Mr. Shoe noted that NSF provides support for both indirect and direct costs in a single award for the total dollar amount. In HHS the grant application provides dollars for direct cost only; indirect cost is a variable amount based on actual rates. There are advantages to the separation of direct and indirect costs in that the latter can be updated when the rates are changing. Both NSF and HHS apply the most currently available rate at the award time. If indirect costs increase, NSF permits the adjustment, but it must be absorbed within the project amount. For HHS, additional cost funds are given, if available, through either a supplemental award or through a post award adjustment. If excess funds result (rare cases), NSF permits the institutions to use the funds for further research. HHS asks that the funds be returned or permits them to be used for a future directed activity within the purpose of the grant. Both NSF and HHS permit full reimbursement of indirect costs except where there are Congressional or administrative limits. HHS, for example, sets a limit of 8 percent on indirect costs for training grants.

Mr. Ellis noted that in 1966 NSF changed from a fixed rate to a negotiated rate for indirect costs. The system presently permits maximum delegation to the institutions for setting those rates. Whereas the HHS rates are derived for universities, NSF looks to other agencies such as the Defense Department for fixed rates for awards. When new rates are determined, NSF allows the institution to use them, but no increased funds are provided. Thus, there are no retroactive adjustments permitted, in contrast to the NIH practice. Paperwork is lessened, and in Mr. Ellis's view, the NSF system is simpler, more efficient, and hopefully provides an incentive to keep costs from escalating. In concluding his comments, he added that in the grants approach discussed by Dr. Nicholson, consideration is being given to expanding the master grants from 9 to 12 schools and to allowing all NSF awards to those schools to be aggregated.

Committee Discussion

The discussion was opened by Mr. Bernard, who asked: If the indirect cost rates increase, does the institution absorb the increase or is it taken from the direct costs allocated in the grants? Mr. Ellis said the institution generally absorbs at least some of the funds rather than take it from the principal investigator.

Mrs. Hoppin and Mr. Fuller commented that they preferred the NIH system over the NSF for handling indirect costs. The NSF system, they said, casts the P.I. and the university in adversarial roles. Mr. Fuller said that generally the university attempts to aid the P.I., and the institution absorbs the additional costs--which they can no longer afford.

Mr. Ellis remarked that NSF is considering the NIH system and may be receptive to change. Dr. Ramey added that the universities are indeed trying to protect the P.I., but the financial squeeze is so great at present that the university cannot subsidize these costs. Thus, the indirect cost rates continue to rise because the resources simply don't exist and inflation persists.

Concerning master grants, Dr. Temin asked whether this approach would have to be authorized by the Congress and whether the program has been evaluated with a view to its expansion. Mr. Ellis noted that the Congress, Federal agencies, and the OMB have been extensively briefed on the approach. There has been a survey of involved P.I.s and the grantee institutions and the results are generally supportive of this approach. Dr. Temin said that the basis of the evaluation thus is user satisfaction.

University of Wisconsin Procedures

Dr. Ebel made a presentation (Attachment H). He noted that faculty and administrators working together have proved to be reasonably effective in dealing with indirect costs and Federal regulations.

Committee Discussion

Dr. Temin commented that there are no incentives for the University of Wisconsin to keep indirect costs down. Like Dr. Bondurant and Mr. Kelly, commenting on Dr. Danforth's presentation at the May meeting of the DAC, Dr. Ebel believes the university is not recovering all of the costs for research being done there. Thus, the indirect cost rates are, in effect, an institutional subsidy to science.

Dr. Wilson pointed out that the financial squeeze in the universities has resulted in a cutting back of the administrative and accounting areas. Much more education is needed among all parties at the university level, she said, to promote the understanding that indirect costs for research are just as real as direct costs.

Dr. Temin raised the issue of the disparity in indirect cost rates, which vary considerably from one institution to another. Dr. Anlyan pointed out that private agencies and foundations need to be educated about indirect costs. He suggested that principal investigators, when they complain of indirect costs, should take into account that the university's subsidies to research must come from students' tuition or such moves as reducing or holding back on faculty salaries.

Mr. Shoe noted that indirect cost rates have clearly been rising faster than direct cost rates. Indirect costs being paid under NIH research grants have gone from an average of about 21 percent in 1970 to 31 percent in 1980, or a 50 percent increase over the past decade. More thought must be given to negotiations concerning these costs, and perhaps controls must be brought into play.

Mrs. Mary Lasker pointed out that there were once caps on indirect costs and that NIH should perhaps reconsider this.

Perspectives from the Office of Science and Technology Policy

Dr. Denis Prager opened his remarks by commenting that OSTP is a statutory office established to provide science advice to the President. Under Dr. Frank Press, the current Director, the office has not only been responsive to the President and the Congress but has also provided technical and scientific advice to the OMB on both budget and management issues. Dr. Prager added that Dr. Press and the President have worked extremely well together and that OSTP has thus had significant impact on Federal science policy.

Of key concern to Dr. Press and the President over the past four years have been the health and vigor of the U.S. scientific enterprise. There is a need for enhancement of the scientific base underlying U.S. industrial innovation and productivity and of the relationships among industry, universities, and government. The major focus has been to look at the interactions and linkages among these sectors that might enhance support for scientific research and its application to technological advances. The key responsibility of the Government here is to promote and enhance basic research. Recently, the President has committed an additional $600 million for fiscal 1981 and 1982 to basic research and to research enhancing industrial innovation.

Joint industry/Government programs can help enhance the relationship between these two sectors. For example a joint program has been established with the automobile industry to support basic research underlying the development of more fuel-efficient cars. Other ventures in the area of food processing and ocean margin drilling are being explored. In addition, a major effort has been devoted to regulatory reform. For example, Federal regulatory agencies increasingly are working with all interested parties in developing performance standards that permit industry to meet agreed upon goals in the most efficient and cost-effective way.

A second important linkage is that between universities and industries. The potential benefits of enhancing the relationship are considerable and merit attention. Dr. Prager only briefly discussed this area, referring instead to his paper with Dr. Omenn that appeared in Science (January 1980).

As this meeting documents, there is increasing interest in the quality of the Government/university relationship. Here, a major Presidential commitment has been to Federal support for basic research, the majority of which is performed by research universities, and to stabilization of NIH research grants at a minimum of 5,000 new awards per year. This reflects much credit on Dr. Fredrickson, who has strongly fostered the effort in seeking Departmental, OMB, Presidential, and Congressional support. Other relevant Presidential commitments have been in the areas of stabilization of support for high-energy physics research, and updating obsolete research instrumentation and facilities.

Turning to the question of accountability, Dr. Prager reported that there is need for achieving a better understanding of the accounting requirements of the Federal Government and the needs of the university in administering the research process. Much is being done, but much remains to be done. Efforts are underway to streamline the peer review processes of NIH and NSF, to reduce the length of applications, to decrease fiscal reporting, to provide for more multiyear awards, and to afford some relief from forms clearance. The National Commission for Research has a very important role here in terms of providing the framework for future discussions, and it is clear that the forum suggested by Mr. Lowe should be created in the near future.

In concluding, Dr. Prager noted that OSTP is committed to an effort to improve Government/university relationships, a most critical partnership. But Dr. Prager noted that all parties must be realistic concerning each other's expectations. Budget limitations will be a continuing feature of the Federal Government, and there can be no institutional revenue-sharing. Central peer review is still the critical process for the distribution of funds; but it is clear that the institutions must be given more discretion and responsibility in dealing with the administration of those funds and in accounting for their expenditure.

Concluding Comments of Committee Participants

Dr. Fredrickson asked how the individual participants judged the fixed obligation grant approach on the basis of all the discussions during this first day of the Committee's meeting. Many of the Committee members and consultants supported the concept, seeing no drawbacks. Mr. Kirschenmann said there was merit to the approach, but that we really have fixed obligation grants now. Still, if the approach can remove a false confidence regarding post-award accountability, then it is better and would provide a better review of the budget.

Dr. Prager observed that the discussion at this meeting and the other DAC meetings he has attended clearly reveals a lack of trust and credibility among faculty and administrators which, in some cases, might be worse than the lack of faith and trust between the Government and the universities. And clearly, the fixed obligation grant approach would increase the stresses on the university and might not be popular with the administrators.

Dr. Anlyan commented that increased staff would be needed to take on these responsibilities. He noted that under the current system, the roles are pretty clear for the department chairmen, the deans, the vice-president for health affairs, and the corporate comptroller. However, with the fixed obligation grant approach, the schools would probably have to mobilize a faculty committee to replace the NIH oversight function.

Mr. Shoe questioned the advantages of the approach and whether it indeed would eliminate time-and-effort reporting. Time-and-effort reporting, he thought, would still be needed for large grants, and cost-reimbursement principles for contracts. Thus, there would continue to be retroactive accounting for both contracts and large grants. And the university would need two tracking systems--one for time-and-effort reporting on large grants and contracts and another for small grants under the fixed obligation approach. Finally, Mr. Shoe pointed out problems of the fixed obligation grant for support of basic research. He stated that the fixed obligation grant for basic research is not possible due to the nature of basic research. Basic research is characterized by indefinite design and uncertainties in performance such that cost of performance cannot be estimated with reasonable accuracy at the outset of the grant. Consequently, in his judgment, basic research is not susceptible to fixed-price treatment.

Mr. Kelly responded that the fixed-obligation grant would highlight the distinction between the contract and grant mechanisms, which was all to the good. The confusion of these two instruments is one of the problems today, and the better they can be defined and distinguished, the better it will be for research management. The purpose of grants is to further the Federal mission for the public benefit, and the goals of the institutions and the Government are one. Contract mechanism is more for the purchase of services required. And Mr. Kelly noted the irony in the fact that the Government pays more in costs, with less requirements, under the contract mechanism than under the grant, where it does not pay full costs and yet requires a higher degree of accounting.

Dr. Temin noted again that this approach will involve the principal investigator more directly in the indirect cost questions. He suggested that the approach be tested in perhaps one institution.

Mrs. Lasker had asked whether there should be any consideration of setting a fixed percentage of indirect costs, and Dr. Fredrickson asked the participants for their views. Mr. Kelly responded that in order to fix these costs, one must arrive at a definition, and that one can always get around that definition by simply increasing the categories that would be assigned to direct costs. Dr. Fredrickson pointed out, however, that the direct costs are rigorously scrutinized by the peer review system. He noted there will be more opportunity for Committee discussion of these issues tomorrow morning.

There being no further discussion, Dr. Fredrickson adjourned the meeting at 5:30 p.m.

TUESDAY, OCTOBER 21, 1980--MORNING SESSION

Dr. Fredrickson opened the meeting at 9:00 a.m. and turned to the first agenda item, a presentation on new HHS Department regulations.

HHS Debarment Regulations

Mr. Riseberg presented an overview of their development. (See Attachment I for the HHS regulations and Mr. Riseberg's remarks.) In Committee discussion Dr. Shaw noted that there were provisions for an appellate process and appointment of a hearing officer. She asked who could serve in that capacity and whether it would always be a Government employee. Mr. Riseberg replied that the hearing officer would generally be an administrative law judge.

Mr. Kelly asked what role there was for the university to play in the debarment process. Dr. Fredrickson said that the key responsibility today and in the future will be the university's judgments and actions.

Dr. Eyzaguirre asked whether the information being obtained in a department proceeding would ever be used against an individual in peer review. For example, would information on scientific questions, financial questions, or both be given to a study section? Dr. Raub responded that relevant information might be given to the study section when deemed appropriate. Indeed, at times the information might help to set the record straight when the study section has heard things secondhand that may not be true. Dr. Eyzaguirre responded that the competition for meritorious grants, so great in a study section, should preclude giving access to such information, as it might have an adverse effect in the judging of the application. Dr. Raub agreed that, in general, this would certainly be the case. And Dr. Fredrickson, in concluding, said that these regulations will not solve important ethical questions--that more experience will be needed to provide a precedent on which to develop future applications. This is indeed the case in the evolution of procedures and requirements for the institutional review boards and the institutional biosafety committees.

NIH Grants Policies Re Commercial Organizations

Dr. Fredrickson opened by alluding to Dr. Prager's comments of the previous day about the President's economic revitalization message with a research initiative for approximately $600 million. That commitment is for basic research and also to revitalize industry and provide capital for new inventions. He said that NIH is preparing possible proposals for consideration by Dr. Press as part of the President's initiatives and that Dr. Raub's presentation that follows should be considered in the context of this White House message.

Dr. Raub stated that the awarding of NIH grants to commercial organizations has been proscribed for the past 20 years. That proscription developed in light of certain violations, and Administration and Congressional concern, when such grants were tried. He pointed out that NIH grants administration then was not as well established with mechanisms and procedures that are in use today.

The Public Health Service, he said, will shortly make a decision as to whether to change its policy so that commercial organizations will be eligible for grants. In large part, this change is based on Congressional actions--namely, the Federal Grant and Cooperative Agreement Act of 1977. In distinguishing between contracts and grants, the former are primarily for the Government to acquire goods and services--that is, for stimulating a broad public purpose. If these principles are applied, then grants should be available to all types of R&D performances and not limited to selected sectors. Given the statutory history and interpretations, there is no reason in the view of the OMB or the Department that grants are interdicted for commercial organizations.

Dr. Raub went on to say that NIH is endorsing the change, but with reservations. There are no statutory bars in the NIH program, no policies here contrary to NIH program purposes, and a very sophisticated grants management system. Thus, applications from commercial organizations should not be excluded if they meet the standards of peer review, have program relevance, and have sufficient priority scores for funding. The reservations are that it might inappropriately alter the arms-length relationship NIH now has with commercial organizations, and that further program benefits accruing from this change are not likely to be measurable. Evidence will be primarily anecdotal. Dr. Raub's judgment is that the pool of potential applicant investigators in commercial organizations is small, and the conditions of grants are such that patents and proprietary rights may be jeopardized. In the main, however, the considerations of equity outweigh the arguments for proscription. The PHS-proposed rules have been published in the Federal Register, and comments have been received and taken into account.

Of the new instruments mandated statutorily, the cooperative agreement is essentially a grant, but the funding agency is to be much more involved in the conduct of the sponsored activity after the agreement is made. Thus, the award tends toward partnership. Cooperative agreements with commercial organizations can be of value in fostering the commercializations of research results, especially where there is not much market for the product. Moreover, the cooperative agreement promises to be of greatest value in such areas as research instrumentation and drugs. It is less likely to be needed in areas such as recombinant DNA technique and hybridomas, where there seems to be sufficient venture capital already available from the private sector.

Committee Discussion

In commenting on Dr. Raub's presentation, Dr. Eyzaguirre suggested other mechanisms that should be sought to spur industrial investment, such as tax breaks for research rather than tapping NIH funds, which would further strain university support. Dr. Raub said that many Federal mechanisms will undoubtedly be used in drawing on the potential of industry. Dr. Anlyan added that there are several bills pending in the Congress which would commit funds to aid small businesses and noted the difficulties this may pose for NIH. Dr. Raub commented that these bills are unlikely to pass in this session of the Congress. The Department in testimony has set forth several of the reservations, those noted by Dr. Anlyan among them.

Mr. Kelly said that he was the author of the original order proscribing grants to commercial organizations. The big decision, he said, was a philosophical one based on the distinction between contracts and grants. Grants are partnerships; contracts are for procurement, with the operations at arms' length. Mr. Kelly stressed that there is no need to use grants for commercial organizations, as the contract mechanism can fulfill those objectives. Indeed, contracts are perfect for commercial organizations, and if they can meet the need it is an error to use grants. Mrs. Hoppin asked whether representatives of commercial organizations would serve on peer review groups. Dr. Fredrickson replied that scientists who are so employed now are eligible to serve and do so. Also, academic scientists are consultants to commercial organizations. It is important to emphasize, however, that study section members are selected not for purposes of organizational representation but primarily on the basis of their qualifications as scientists.

Dr. Bennis commended Dr. Raub for his presentation of the issues. He commented, however, that commercial organizations do not have a good history for doing things with high social needs and poor markets. So why should grants be given to them? Dr. Kabat stressed the importance of preserving the distinction between grants and contracts as noted by Mr. Kelly. And Dr. Bondurant pointed out that the behavior of commercial organizations may change with this policy change, much as it has in those industries performing for the Department of Defense. It will be most important to consider carefully what form of cooperative agreement to employ. Dr. Raub noted that NIH has been very conservative in using the cooperative agreement authority and is likely to continue in that way.

Dr. Goldberger pointed out that research information with proprietary implications is a growing problem at research conferences and in publication of research results, where concerns are being expressed that secrecy may replace open exchange of information when proprietary rights are involved. Dr. Raub agreed that this is a problem, and one that must be faced by NIH and its study sections for current grantees.

Dr. Fredrickson observed that biology is becoming more like chemistry with its clearer commercial payoffs. The United States presently does not have a business/university nexus as you might find in Germany and Japan, so that much more thought must be given here about the directions in which we are going. NIH serves as a bridge between the public and the scientists, and it has its own attitudes as an organization. This might be a topic for general review at the next DAC meeting.

In Dr. Ramey's view, commercial organizations exist for profits and not necessarily for increasing knowledge. They will only go into areas, she believes, where there is a chance for sales and profits, much as Dr. Bennis noted. Dr. Anlyan suggested it might be better to help industry by taking a look at the regulations rather than giving them NIH grant funds.

NIH Training Trends and Policies

Dr. Carl Douglass presented recent data from the Division of Research Grants on principal investigators who have Ph.D.s or M.D.s. New investigators, he said, average 11 percent of all P.I.s with research project grants (ROIs), and this has been about the same for the past 10 years. In terms of length of stay within the system, several cohorts have been followed during the last 20 years. The median survival time of early cohorts (FY 1949 and FY 1954) was 13 to 14 years, whereas the median survival time of the FY 1969 cohort was only 6 or 7 years. In terms of percentage, physicians constituted 35 percent of the new P.I.s on project grants in 1964, but only 18.5 percent in 1978. The absolute numbers of new M.D. applicants stayed in the mid 100s, whereas the absolute numbers of new Ph.D. applicants have increased from 1,000 to 2,000; and the trends show that the number of M.D.s receiving awards, in the absolute as well as in relation to Ph.D.s, has been declining since 1964. However, the absolute number of M.D.'s has remained relatively steady since 1970, while their proportion in relation to all P.I.'s continued to decline during the period 1970-1978.

In the NIH training programs in 1971, M.D.s constituted 35 percent of the individual trainees and 77 percent of the trainees under institutional awards. In 1978 those figures were 20 percent and 42 percent, respectively. In the most recent review rounds, on the average, M.D.'s made up about 15 percent of the NRSA postdoctoral fellowship applications, which provides additional evidence of the trend showing decreasing participation of M.D.'s individually reviewed and supported in NIH research programs.

Committee Discussion

In the discussion a number of reasons for the decline of the physician in clinical research were cited. In the early '70s the cut in Federal research fellowships, where medicine and primary care are emphasized, has led to a precipitous decline in physician research. Dr. Eckstein commented that the NRSA training authority with its pay-back provision was a poor substitute for the broad training authority that NIH had in the '60s. Dr. Thier felt that the medical students today are more interested in practice and teaching than in research. The regulations, the lack of stable support, and the feeling that clinical investigation does not quite confer the prestige of the basic sciences all combine to discourage the physician researcher.

Dr. Eyzaguirre noted from his experience that clinical research was faring poorly in his study section. Mr. Kelly noted that the academic leadership in the past decade has focused more on funding the academic center, and correspondingly, with the attention of administrators focused on clinical care and third-party payment, fewer are interested in research careers. Dr. Thier said that the same is true of the clinical activity in his Department at Yale. There is no massive increase in patients; but a lot more income is generated, though perhaps to some extent because of more sophisticated accounting procedures.

Dr. Merritt spoke briefly of NIH training policies. She noted several promising Institute programs, such as NIGMS training grants for M.D./Ph.D.s, more program support for clinical research training, short-term training for medical students that might give them a taste for research, and manpower development awards that provide up to $30,000 in salary with a five-year commitment. There should be strong interest and support in the medical schools for these programs.

Dr. Ramey remarked that perhaps the major reason students are not going into research is that they cannot afford it. A medical education is so expensive that a medical student at graduation may have debts of $50,000 to $80,000. This militates against a research career. Dr. Bondurant, however, sees promising signs that students are becoming interested in research again as a worthy goal for societal benefit.

Dr. Fredrickson then made some closing comments. Dr. Wilson and Mr. Kelly will revise their paper, he said, and it will be considered widely within NIH and should certainly be presented to the forum that Mr. Lowe will create. NIH will examine the issues raised concerning the organization grant and the appropriate mix between grants of this type and those for research projects. He thanked the Committee members and consultants for their excellent contributions and expressed his conviction that this Committee meeting will serve well as a base for future Federal action in this most important area. And, he noted, consideration will be given to the agenda of the next DAC meeting on Government/university/industrial relationships. The meeting was adjourned at noon.

Respectfully submitted,

Joseph G Perpich

Joseph G. Perpich, M.D., J.D.
Executive Secretary

National Institutes of Health
Bethesda, Maryland 20205
November 25, 1980

Attachments

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH
BETHESDA, MARYLAND 20205

August 15, 1980

Dear

I am writing to provide you with preliminary information on the next meeting of the Advisory Committee to the Director, NIH, which will be held on Monday and Tuesday, October 20 and 21.

This meeting will follow up on the issues raised at our meeting of May 13-14. (Minutes of that meeting with relevant attachments are being sent to you under separate cover.) We are arranging for several presentations addressed to improved ways of dealing with research cost and accountability issues: Mr. Steve Bernard, Deputy Director of the NIH Division of Contracts and Grants, will discuss several possible modifications in the existing NIH grant system; Dr. Linda Wilson and Mr. James Kelly will examine possible use of the "fixed-price" grant as a means of easing administrative burdens at grantee institutions; Dr. John Sherman of the AAMC will discuss the institutional grant model, drawing on NIH experience in use of the biomedical research support grant; and Dr. Sam Herman, Associate Vice President for Research at Temple University, will talk about single-instrument support for major research institutions, using for a model the Cancer Institute's large grant to Sloan-Kettering in the 1960's.

Also, as a followup to our earlier discussions on university mechanisms for setting indirect cost rates for sponsored research, Dr. Marvin Ebel of the University of Wisconsin will brief the Committee on how his institution, through its joint faculty-administration efforts, has attempted to deal with this issue.

Federal perspectives will be presented by Mr. Richard Lowe, HHS Inspector General (Designate), Mr. Jack Markowitz of the Public Health Service, Mr. Gaylord Ellis of the National Science Foundation, and Dr. Denis Prager of the Office of Science and Technology Policy.

A useful resource document for the May meeting of the Advisory Committee was the report of the National Commission on Research entitled Accountability: Restoring the Quality of the Partnership. The Commission's more recent report, Funding Mechanisms: Balancing Objectives and Resources in University Research, should serve a comparable function for our October meeting. A copy of this report is enclosed for your review.

A firm agenda for the second day's meeting has not yet been set. Tentatively, however, a number of topics are being considered that flow from the cost and accountability issues discussed above and from some of the health research planning issues that have been of key concern to the Committee over the past three years. In terms of the tentative agenda, our plan is that each speaker will prepare a draft paper by September 15 which can then be sent to the commentators for their review. We do not expect more than a 5 to 10 page draft; no written comments are expected from the commentators. By October 1, we hope to distribute the papers to all members of the Committee and consultants.

As you well know, these issues are of critical importance to the universities and to the Federal Government. I am hopeful that the Committee will now take the next step in the process begun at the highly successful May meeting, to examine possible alternatives to existing research support practices and to provide guidance on feasible approaches for strengthening the research associations between the universities and the Government. You will receive further information on the meeting, including the agenda for the second day, in late September or early October.

Sincerely,

DS Fredrickson

Donald S. Fredrickson, M.D.
Director

Enclosures

September 1980

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REMARKS BY

RICHARD B. LOWE III

INSPECTOR GENERAL (DESIGNATE)

DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

41ST MEETING

OF THE

ADVISORY COMMITTEE

TO THE DIRECTOR

NATIONAL INSTITUTES OF HEALTH

"PERSPECTIVES OF THE INSPECTOR GENERAL ON FEDERAL FUNDING MECHANISMS"

MONDAY, OCTOBER 20, 1980

I very much appreciate the opportunity to participate with you in today's NIH Advisory Committee meeting.

I am quite sure that the topics to be presented will generate a lively discussion and debate on the various issues and problems which affect our National Research effort at Educational Institutions.

I am sorry I missed your meeting on May 13 and 14 which covered "Cost and Accountability" since it directly relates to today's meeting on the subject of "Federal Funding Mechanisms".

As a newcomer to the Federal Government-University research accountability problem, I have made a few observations which I would like to pass on to you for your consideration. However, before doing so I would like to provide you with a brief overview of the Office of Inspector General.

On October 15, 1976, Congress enacted Public Law 94-505 that created the first statutory Inspector General in U.S. Civil Government at the Department of Health, Education & Welfare. The Office became operational on March 29, 1977 and a distinguished public servant, Tom Morris, was designated to serve as HEW's first Inspector General.

Perhaps it was the success of this office, and the Congress' continuing concern about reports on fraud, abuse and waste in other cabinet departments that caused it to expand the IG concept. In 1978, Congress established 12 additional Inspectors General in major departments and agencies. This Act, like the original one for my office, required that each Inspector

General periodically submit reports to the Congress on progress and problems related to fraud, abuse and waste.

The Office of the Inspector General at HHS consists of three major operating components:

1. the Audit Agency,
2. the Office of Investigations, and
3. the Office of Health Care & Systems Review

Although each of these organizations carry out a somewhat different role, their activities are coordinated and complement each other.

The Audit Agency has a staff of about 675 professional auditors at 52 locations and their work in calendar year 1979 resulted in the issuance of over 1,500 audit reports--485 of which relate to research grants and contracts carried out at Educational Institutions.

In 1979 these 1,500 reports identified some $188 million in recommended financial adjustments of which about $14 million related to audits at institutions of Higher Education. However, there was also an additional $187 million of costs claimed by universities which were not supported by accounting or other records required by Federal regulation. As a result, these amounts had to be set-aside for negotiation between program and university officials.

THESE ARE THE MAJOR PROBLEMS THAT LEAD TO RECOMMENDATIONS FOR COST RECOVERY:

- Charges to federal projects which exceeded actual effort devoted to them.
- Cost transfers made for the purpose of eliminating cost-overruns.
- Use of billing rates higher than needed to recover costs (supplies, fringe benefits, computer services, etc.).
- Unapproved use of institutional employees as consultants.
- Fellowship and other financial assistance grants to students charged as salaries.

In addition to these matters which form the basis for cost-recommendations, other findings frequently include the need for improvements in cash management systems, and better control and accountability over equipment and supplies.

The Office of Investigation is somewhat smaller--it has a staff of about 110 criminal investigators at 29 locations and their work in 1979 resulted in the referral of over 170 cases to the Department of Justice for possible criminal prosecution.

In 1979 the OI referrals to the Federal and State prosecutors resulted in 150 convictions with funds identified for recoveries, fines and restitutions amounting to over $14 million.

Many of these cases involved the health-care field -- the Medicare, and Medicaid programs. The incidence of fraud and abuse in health, welfare, and student financial aid has been much more of a problem than we have experienced at universities, where fraud and abuse appear to be of minor proportions.

Nonetheless the few instances of fraud on the part of a principal investigator or researcher have received widespread adverse publicity which raised questions in the minds of the General Public and the Congress as to whether the wrongdoing was just an isolated instance or whether it was just the tip of the iceberg.

The third component, the Office of Health Care and Systems Review consists of a small staff of senior experts (about 40) with specialized experience across the range of HHS activities. These professionals include physicians, lawyers, management and computer experts, as well as other program specialists.

One of the functions of HCSR is to determine how effective the department's delivery of services is perceived by the users. This requires the setting up of a service delivery assessment system. About a dozen of these assessments have been completed and reported to the Secretary each year. These include such subjects as: Home Health Care for the Elderly; Family Planning for Teenagers; Foster Care; and Education of the Handicapped.

We have not as yet performed any assessments of the NIH programs but we hope to do so in the near future. Any suggestions you might have for areas to be covered in these reviews would be most welcome.

In an attempt to overcome the problems I previously mentioned related to accountability for funds and to help overcome any tension that may have developed in the University-Federal Government relationship, the Office of Management and Budget issued two circulars that are very important to your research programs.

The first of these is called the A-21 Cost Principles. This circular, which became effective October 1, 1979, in my opinion represents an improvement in many respects over its predecessor, Federal Management Circular 73-8.

It does not, however, represent a fundamental change in the way the Federal Government pays Universities for their research efforts: "Reimbursement of costs" remains the basic criterion. Under it, the major element of cost--Salaries must be supported by a "Monitored workload system" (which I understand is not receiving great receptivity) or by a personnel activity reports system, each of which requires after-the-fact certification.

I fully understand that the Time or Effort certification requirements are not part of the traditions of university researchers. However, the acceptance of Federal funds implies acceptance of the conditions under which they are offered.

I understand that some of you feel that the government has not gone far enough in changing its accountability requirements. In my opinion, if A-21 remains less than desirable to the Universities, they have every right to continue to pursue changes, perhaps using their own creativity to develop alternatives that would be acceptable to both government and themselves. I will say more on this subject later.

The other OMB Circular is called the A-110 Uniform Administrative Requirement. This circular was implemented by HHS in August 1978 and appears in Title 45 of the Code of Federal Regulations. The circular, which became effective on September 1, 1978, places a new requirement on Universities. It requires them to have an audit performed, preferably on an annual basis, but no less frequently than every two years. Arrangements for these audits are the responsibility of the University and the audits can be carried out by CPA's, internal auditors, or in the case of State Universities, by State auditors.

This change certainly is designed to improve accountability for Federal dollars. Nevertheless, I am aware of your concerns that our nation's biomedical research effort may be impeded by diverting scarce research dollars to additional auditing.

Reexamine Alternatives

Many of us would agree that a reasonable balance needs to be struck between the government's need to account for the taxpayers funds and the university's need for flexibility in administration. Our concern for such a balance caused my predecessor Tom Morris, myself, and senior staff of the Audit Agency to ask for a meeting with Comptroller General Elmer Staats in August 1979. Our purpose was to discuss the direction that these new circulars were taking and to explore with the Comptroller General alternative means of financing Federally sponsored research at University establishments. Discussions were also held with the Association of American Universities.

Because the work of the National Commission on Research was underway, we deferred pursuing our suggestions any further pending the findings of the Commission. When the Commission issued its report earlier this year it recommended the establishment of a new and independent Forum "to watch over the government-university relationship and guide its evolution". In my judgment, this can be an effective means to bring out some new thinking and perhaps a more effective solution to a long standing problem.

The Association of American Universities was also concerned that we move ahead rapidly to pursue the Forum concept. On July 28, the Comptroller General hosted a meeting between University, Government, and National Commission Representatives during which there was substantial discussions on the Research Commission's recommendations.

Questions dealing with how the Forum could be funded, whether there should be separate groups (non-Federal and Federal) working with the same issues on a parallel basis and suggestions on the composition of the Forum members were among the many items discussed.

Although there was not complete unanimity on how to best organize such an undertaking, there was agreement that the present system is not working optimally.

It was also agreed that the White House Office of Science and Technology Policy be invited to be part of the Policy Group working towards the establishment of the Forum. Dr. Bartlett, President of the AAU has met with Frank Press and is optimistic that his office will join this endeavor.

We expect some further feedback from additional sources and once received, a follow-up meeting with the Comptroller General is planned. We have invited Dr. Frederickson to attend this meeting and to be one of the HHS representatives on the policy group.

Suggestions For Forum To Consider

I would like to mention some alternatives which have been suggested to be among the many areas that will be studied by the "Forum".

On Cost Reimbursement, these ideas have been raised:

1. Should payment for research grants be based on cost-reimbursement principles or could there be other payment methods which may be more appropriate, given the nature of the research program.

   If the Forum were to find that "Cost Reimbursement" is the best of all alternatives then -

   a Is it appropriate that Federal Government policy provide for an error tolerance? It has been suggested that if a reasonable percentage for error can be established then Universities would not be expected to repay the Federal

Government for any errors that are below the accepted tolerance. Such a policy is now authorized in our Federal-State Welfare Programs, but under rather different circumstances.

b. Should Cost Reimbursement be "Costs" only or might a "Cost plus a fixed fee", or "Cost plus an incentive fee" basis be appropriate? As an example, incentive arrangements could be developed by which Universities would share in any savings resulting from outstanding accomplishments or for implementing a highly cost-effective system.

c. Should cost reimbursement concepts be expanded to provide for the Universities to receive an allowance for a "Return on Investment on Capital Assets"?

Under existing cost principles, Universities are allowed to recover depreciation or a use allowance which represents a return of investment in capital assets but the principles do not allow for a return on investments.

d. A number of Universities now follow a practice that does not fully identify faculty who actually work on federally funded research projects but because of University policy do not claim applicable salary as an allowable expense.

As an example "tenured faculty", salaries in some instances are not charged to research projects even though the faculty member devotes a portion of his efforts to these activities.

In cases where this happens should Universities be allowed to substitute these costs to offset any disallowances that may have been raised during an audit. On the other hand should the University practice be considered as "mandatory cost sharing" because the research project's approval may have been made based on the Universities' willingness to contribute these faculty services.

Some ideas have been advanced for Fixed Sum Awards:

1. Is a fixed sum award appropriate for use in the research grant program or would the Federal Government lose too much accountability under this type of arrangement? In the commercial profit-making sector any profit made under fixed price awards can be subsequently used for whatever purpose the company sees fit.

   In the research grant program we can establish controls so that any excess of fixed sums received over sums expended must be used in future periods for research and cannot be diverted to non-research purposes. Further, simple measures can be adapted so that "savings" are not used up by the payment of inflated salaries or other inappropriate benefits to individual researchers.

   To encourage efficient and economical practices, perhaps a portion of any "savings" could be used by researchers for any research purpose they deem worthwhile without requiring approval from Federal officials. The balance of savings would have to be used in furtherance of the purpose stated in the grant award.

Here are some thoughts on the Roles of Principal Investigators and University Administrators that the Forum could examine:

What are the respective authorities and responsibilities of principal investigators and university administrators and to whom should the Federal Government look to for satisfaction if either the researcher or administrator violates Federal regulations?

As an example, if a principal investigator uses Federal research funds in a fraudulent manner, who should make the appropriate reimbursement to the Federal Government? Is it the principal investigator or should reimbursement come from university general funds? Does it make any difference whether the university should have established necessary controls to prevent or detect such abuses?

What are the responsibilities of the university and the principal investigator in potential conflict of interest situations? Suppose a university researcher agrees to conduct the same research for a private company and for the government, while getting paid by both? Or suppose he is privately receiving consultation payments from an industry and is acting as a scientific advisor to government on questions related to that industry? I hope the proposed forum can help show us how to protect the public interest without unduly impeding the legitimate transfer of technological information.

These alternatives may be considered controversial, however they represent examples of the creative thinking that is needed to assist all of us in developing solutions to these complex problems.

Thank you.

ADMINISTRATION OF GRANTS

FEDERAL REGULATIONS

TITLE 45 PART 74

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY, OFFICE OF GRANTS AND PROCUREMENT

[197]

Code of Federal Regulations

Title 45—Public Welfare

SUBTITLE A—DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, GENERAL ADMINISTRATION

PART 74—ADMINISTRATION OF GRANTS

Subpart A—General

Sec.
74.1 Purpose and scope of this part.
74.2 Scope of subpart.
74.3 Definitions.
74.4 Applicability of this part.
74.5 Appeals.
74.6 Deviations.
74.7 Special grant or subgrant conditions.

Subpart B—Cash Depositories

74.10 Physical segregation and eligibility.
74.11 Checks-paid basis letter of credit.
74.12 Minority-owned banks.

Subpart C—Bonding and Insurance

74.15 General.
74.16 Construction and facility improvement.
74.17 Fidelity Bonds.
74.18 Source of Bonds.

Subpart D—Retention and Access Requirements for Records

74.20 Applicability.
74.21 Length of retention period.
74.22 Starting date of retention period.
74.23 Substitution of microfilm.
74.24 Access to records.
74.25 Restrictions on public access.

Subpart E—Waiver of Single State Agency Requirements

74.30 Policy.

Note. In this copy of 45 CFR Part 74, the pages of each subpart are numbered seperately. If HEW amends Part 74 to expand a subpart, this numbering system will make it possible to add pages to that subpart without renumbering the pages that follow.

August 2, 1978

Subpart F—Grant-Related Income

Sec.
74.40 Scope of subpart.
74.41 Meaning of program income.
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Appendix F—Principles for determining costs applicable to grants and contracts with nonprofit institutions.

AUTHORITY: 5 U.S.C. 301.

Subpart H—Standards for Grantee and Subgrantee Financial Management Systems

§ 74.60 Scope of subpart.

This subpart prescribes standards for financial management systems of grant- and subgrant-supported activities. Awarding parties shall not impose additional standards on recipients unless specifically provided for in a Federal statute (e.g. the Joint Funding Simplification Act, Pub. L. 93-510) or these regulations. However, suggestions and assistance may be provided in establishing or improving financial management systems when needed or requested.

§ 74.61 Standards.

Grantees and subgrantees shall meet the following standards for their grant and subgrant financial management systems.

(a) *Financial reporting.* Accurate, current, and complete disclosure of the financial results of each project or program shall be made in accordance with the financial reporting requirements of the grant or subgrant. The terms of grants and subgrants shall not require financial reporting on the accrual basis if the recipient's accounting system is maintained on the cash basis. When accrual reporting is statutorily required, a recipient whose accounting system is not maintained on that basis shall not be required to convert it to the accrual basis; the recipient may develop the accrual information through an analysis of the documentation on hand.

(b) *Accounting records.* Records which identify adequately the source and application of funds for grant- or subgrant-supported activities shall be maintained. These records shall contain information pertaining to grant or subgrant awards, authorizations, obligations, unobligated balances, assets, outlays, income, and, if the recipient is a government, liabilities.

(c) *Internal control.* Effective control and accountability shall be maintained for all grant or subgrant cash, real and personal property covered by subpart O of this part, and other assets. Recipients shall adequately safeguard all such property and shall assure that it is used solely for authorized purposes.

(d) *Budgetary control.* The actual and budgeted amounts for each grant or subgrant shall be compared. If appropriate or specifically required, recipients shall relate financial information to performance or productivity data, including the production of unit cost information. If unit cost data are required, estimates based on available documentation will be accepted whenever possible.

(e) *Advance payments.* Procedures shall be established to minimize the time elapsing between the advance of Federal grant or subgrant funds and their disbursement by the recipient. When advances are made by a letter-of-credit method, the recipient shall make drawdowns as close as possible to the time of making disbursements. Grantees advancing cash to subgrantees shall conform sustantially to the same standards of timing and amount as apply to advances by Federal agencies to grantees, including requirements for timely reporting of cash disbursements and balances. (See subpart K of this part.)

(f) *Allowable costs.* Procedures shall be established for determining the reasonableness, allowability, and allocability of costs in accordance with the applicable cost principles prescribed by subpart Q of this part and the terms of the grant.

(g) *Source documentation.* Accounting records shall be supported by source documentation such as cancelled checks, paid bills, payrolls, contract and subgrant award documents, etc.

(h) *Audits.*—(1) *General.* External or internal audits shall be made in accordance with generally accepted auditing standards, including the standards of the U.S. General Accounting Office's publication "Standards for Audit of Governmental Organizations Programs, Activities, and Functions."[1] The auditors engaged by the recipient shall meet the criteria for qualifications and independence in that publication.

(2) *Purpose and scope.* The purpose of these audits shall be to determine the effectiveness of the financial management systems and internal procedures established by the recipient to meet the terms of its grants and subgrants. The recipient's auditors need not examine every grant or subgrant awarded to the recipient. Rather, audits generally should be made on an organization-wide basis to test the fiscal integrity of financial transactions and compliance with the terms of awards. These tests would include an appropriate sampling of Federal grants and subgrants.

(3) *Frequency.* These audits shall be conducted on a continuing basis or at scheduled intervals, usually once a year, but at least every two years. The frequency shall depend on the nature, size and complexity of the recipient's grant- or subgrant-supported activities.

(4) *Relation to Federal audit.* These audits may affect the frequency and scope of Federal audit. However, nothing in this section is intended to limit the right of the Federal Government to conduct an audit of a grant- or subgrant-supported activity.

(5) *Audit resolution.* The recipient shall follow a systematic method to assure timely and appropriate resolution of audit findings and recommendations.

(6) *Copies of audit reports.* A copy of each audit report, and a description of its resolution, shall be furnished to the appropriate regional office of the HEW Audit Agency.

End of Subpart H

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[1] Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NACUBO JUNE 1980

business officer

NEWSMAGAZINE OF THE NATIONAL ASSOCIATION OF COLLEGE AND UNIVERSITY BUSINESS OFFICERS

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College Housing Loan Regulations Proposed 3

The Department of Housing and Urban Development has issued proposed regulations for this year's College Housing Loan program. Approximately $85 million will be available for 3 percent loans this year. (The proposed rules are reprinted beginning on page 4.)

GAO Criticizes College Housing Loan Program 5

The General Accounting Office has issued a report identifying two major areas in which the College Housing Loan program could be improved: management weaknesses in the selection of projects for funding, and delays in final approval of loan agreements.

TIAA-CREF Meets with NACUBO and CUPA 6

Representatives of NACUBO and the College and University Personnel Association met recently with officials of TIAA-CREF to discuss issues affecting campus employee benefits.

OMB Circular Imposes Grant Audit Requirements 8

OMB Circular A-110 imposes certain audit requirements on all organizations receiving federal grants or cooperative agreements. A summary of the requirements as they relate to colleges and universities is given.

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OMB Circular A-110 Imposes Audit Requirements on Institutions with Grants

OMB Circular A-110 imposes certain audit requirements on all organizations receiving federal grants or cooperative agreements. These requirements appear in Paragraph 2h of Attachment F: Standards for Financial Management Systems.

OMB Circulars are addressed to federal agencies. Their provisions are applied to institutions only through the medium of regulations issued by the agencies making awards or by agencies to whom cognizance has been assigned. In the case of most educational institutions, audit cognizance has been assigned to HEW—or, as it is now known, the Department of Health and Human Services (HHS).

HEW's implementation of Circular A-110 appears in the form of Title 45 Part 74.61h of the Code of Federal Regulations (45 CFR 74.61h). The audit requirement is included in a revision of Part 74 that appeared in the August 2, 1978 *Federal Register*, page 34076.

A summary of the requirements of 45 CFR 74.61h follows. Those few institutions not under HHS cognizance will have a different source for guidance, but the requirements will undoubtedly be quite similar, since they are based upon Circular A-110.

Choice of Auditor. The required audit may be performed by any qualified auditor, internal or external, who meets certain criteria for independence. In general, auditors must be sufficiently independent of those who authorize the expenditure of federal funds to produce unbiased opinions, conclusions, and judgments. The detailed criteria for independence, together with examples of situations that might impair an auditor's independence, appear as Chapter 3 of Part 3 of a U.S. General Accounting Office (GAO) publication. This publication, "Standards for Audit of Governmental Organizations, Programs, Activities and Functions" may be obtained from the Superintendent of Documents, Washington, DC 20401, for 65 cents (stock no. 2000-00110).

Purpose and Scope of Audit. The audit should be designed to ascertain the effectiveness of the financial management systems and of the internal procedures that the institution has established to meet the terms of its federal agreements.

Sampling. There is no need to examine every award. Rather, the audit should be made on an organizationwide basis to test the fiscal integrity of the financial management systems and compliance with the terms of the awards. These tests would include an appropriate sampling of federal grants, subgrants, or cooperative agreements (procurement contracts are not covered by Circular A-110 or by Part 74). The extent of the sampling is left to the auditor's judgment and may depend on the quality of internal controls.

Frequency. These audits are to be conducted on a regular basis, usually annually but at least every two years. For most institutions, an audit should be performed by August 1980.

Relation to Federal Audit. These audits do not replace the audit responsibilities of the federal government. They may, however, affect the frequency and scope of federal audits, whether favorably or not.

Relation to Traditional Audit. Most institutions have always had regular audits, either by commercial CPA firms or by state auditors. These audits have not normally included tests of compliance with the terms of federal agreements. Some institutions may choose to have these compliance tests added to the regular audit. Others may choose to have them handled separately. Internal auditors may be used for the purpose, if qualified and independent as described above.

Audit Resolution. The institution must follow a systematic method to assure timely and appropriate resolution of audit findings and recommendations.

Copies of Audit Reports. For those institutions under HHS cognizance, a copy of each audit report and a description of its resolution is to be furnished to the appropriate regional office of the HHS Audit Agency.

Special Program Audits. Certain programs have special audit requirements, including student financial aid programs. These requirements are still in effect and are not subject to 45 CFR 74.61h.

GAO Guidelines. In February 1980 the General Accounting Office issued a standard audit guide to replace the large number of individual program audit guides applicable to state and local governments. Entitled "Guidelines for Financial and Compliance Audits of Federally Assisted Programs," it was published in the April 2 *Federal Register*, page 21837, but only as an adjunct to a revision of OMB Circular A-102. That circular applies only to state and local governments and to Indian tribal governments. While a similar audit guide is planned for eventual publication as a part of Circular A-110, the GAO guide does not apply to colleges and universities. While parts of the guide may be of some use, any attempt by auditors or others to impose it as a mandatory requirement should be firmly resisted.

Cost of Audit. It is appropriate to include audit costs in the research administration pool to the extent that they can be identified with audits directed specifically to federal projects. Otherwise, audit expense should be included in the general and administrative expense pool.

MODIFICATION OF THE EXISTING NIH GRANT SYSTEM

Director's Advisory Committee Meeting, October 20-21, 1980

By
Steven C. Bernard
Office of Extramural Research and Training, NIH

Background

In June 1980, NIH launched an introspective examination of several aspects of our existing grant system with a goal of evaluating what we are now doing and to simplify and improve the process as deemed appropriate. This initiative began with the establishment of three working groups under the aegis of NIH's Grants Management Advisory Committee (GMAC), which were respectively charged with considering:

1. Question of "Automatic" Carryover 1/
2. Intermingling of Funds Between "Closely Related" Grants
3. Changes in Due Date Requirements for Expenditures Reporting

Because of time considerations at today's meeting, I am going to focus on only the first two issues (i.e., "automatic" carryover and intermingling of funds between "closely related" grants) since we believe they will be of most general interest to this audience.

1/ "Carryover" in this context meaning the authorized transfer of unobligated balances from one period for use in a subsequent period as additional income. At present, this is allowed with the prior approval of the awarding unit; the question being examined was whether or not this should be authorized "automatically."

Carryover - Prior Approval of Awarding Unit or "Automatic?"

Current PHS policy allows for estimated or actual unobligated balances remaining at the end of a budget period to be treated by awarding units in the following ways:

1. As an offset (deduction) from the continuation award, if there is one
2. As a refund to the Government (generally occurs only at termination of project support)
3. As a carryover for use in a subsequent budget period, as additional funding authorized for purposes requested and justified in the continuation year application

These options have been in effect since the initiation of the project period system on July 1, 1964. Prior to that time NIH's policy permitted any unexpended balance up to $5,000 or one-half of the amount of the continuation grant, whichever was less, to be transferred from one budget period to the next non-competing continuation grant and thus remain available for expenditure during that subsequent period. This was an automatic practice and did not require prior approval. With the advent of the project period system, NIH was obliged to abandon its automatic carryover practice, primarily because of criticism directed at NIH at that time by the General Accounting Office. GAO objected to grantees being allowed to retain funds without any specific justification or expressed need. The new system extended awarding units the prerogative of authorizing carryover, but on the basis of specific justification and with prior approval of the awarding unit. This practice has remained in force to the present time.

Rightly or wrongly, the prevailing NIH philosophy for the last 16 years has been predicated on preserving funds for which there is no expressed need or justification and thereby accrue "savings" 2/ which in the aggregate allow us to fund more grants. Since we have many meritorious projects which have been approved, but because of their relative priority standing cannot be funded within available appropriations, this long-standing practice/philosophy has been judged (by NIH staff at least) to be desirable. It has been our contention that by thus increasing the research base, we benefit grantee institutions through the award of additional grant projects and at the same time enhance biomedical research broadly.

To give some perspective to NIH's utilization of unobligated funds, I would like to present some data (Exhibit I). What you see displayed is a five year history (FY 1976-1980) of unobligated balances actually applied against then current year awards. These offsets, broken down by major program type (i.e., traditional research project, program project, etc.) and total for all awards, reveal a rather uniform pattern. For example, the overall percentage of unobligated balances, which in this context represent "savings", are very consistent (Exhibit II), ranging tightly between 2.4 and 3.2% of the total budgeted amount.

2/ Unobligated balances are applied as offsets (deductions) to continuation awards and thus reduce the amount of "new money" required to fund a given authorization level.

On the one hand the percentage of savings may appear insignificant and unimpressive, but dollar-wise the cumulative "savings" factor takes on greater weight. This same five year period provided total offsets ranging from a low of nearly \$43 million to a high of \$61 million. Based on an average size research project grant award of \$78,000, these offsets potentially provided for 3,281 awards which otherwise would have gone unfunded during this five year period.

Another order of magnitude is to compare the approximately \$54 million unobligated balance figure for FY 1979 with total obligations of selected NIH components' entire operations for the same fiscal year:

NLM	\$40.5 Million
NIA	\$56.5 Million
NIDR	\$65.0 Million

The cumulative offsets applied NIH-wide exceed or approximate each of these three components total obligations for their inclusive operations.

Use of Unobligated Balances Reported For Terminal Year Awards

At the outset, I mentioned that one of the options available to awarding units for disposition of unobligated balances was that balances could be returned "as a refund to the Government." It was noted that this generally occurs only at termination of project support. Balances accruing in terminal years represent another form of "savings" which are critical to the financial management of NIH's Indirect Cost Management System (ICMS). NIH operates a reimbursement system which provides for final settlement of indirect costs, adjusted to actual. Indirect costs are commonly advanced to most of our grantees on a provisional basis. Subsequent to issuance of a grant award, allowable rebudgeting or negotiated changes in indirect cost rates effecting that award may increase the earned indirect costs (decreases may occur also). In cases of increased bases or rates, NIH "owes" the grantee institution additional funds, if, indeed, it intends to pay actual costs. The additional dollar requirements necessary to meet this obligation are shown in the settlement figures for FY 1966-1979 (Exhibit III). You will note that additional dollars in the $10-15 million range are required each year. The funds to meet this additional requirement are largely derived from terminal year "savings."

Other funding agencies do not have this problem because they do not provide for after-the-fact adjustments. In short, they "fix" the indirect cost allowance at the outset and oblige the recipient to absorb any increase.

Having examined historical trends and available expenditures data, it is the preliminary consensus of NIH's Grants Management Advisory Committee that we should not resurrect an "automatic" carryover practice. We believe that the existing system offers flexibility for individual cases while at the same time providing maximum efficiency in the utilization of unobligated funds, which flow back to grantee institutions in the form of additional awards that accrue to their benefit and hopefully the "general good." We prefer the existing system in that it provides for:

1. Carryover of unobligated balances on a case-by-case basis when requests are judged to be justified and warranted under the individual circumstances

2. Funding additional meritorious awards (which otherwise would not be made) through the use of cumulative "savings"
3. Upward adjustments of earned indirect costs through the use of terminal year "savings", thus meeting our obligation to pay actual overhead costs

Intermingling of Funds Between "Closely Related" Grants

One of the most significant audit resolution problems that DHHS program agencies have faced in recent years is numerous untimely and undocumented cost transfers by audited grantee and contractor institutions. In the absence of adequate documentation, most of the questioned cost transfers appeared to have been made to eliminate an overrun (deficit) in one or more projects or to "use up" unobligated funds at the end of a project period. NIH audit settlements involving unallowable cost transfers during the past three calendar years have resulted in recoveries totalling approximately $5 million.

As a part of settlement negotiations, it was not uncommon for an audited institution to argue that the transferred cost could be charged to either project because together they were supporting "one identified activity." Translated, this means that recipients contended after-the-fact that the separately supported projects were so "closely related" that their costs should virtually be interchangeable.

Current PHS policy provides for a limited application of this general concept, but as presently stated it is applicable only to salaries, and only then when agreed to in advance by the PHS component. The applicable statement reads:

> "When an employee is working on two or more grant-supported projects, his/her salary will be prorated to each project based on the time or effort devoted to each project. However, if PHS has agreed in advance that two or more grants concurrently support one identified activity or program, the salaries need not be prorated. In such instances, salaries may be charged to any one of the grants involved."

Given the fact that the preponderance of NIH support is in the form of discrete project grants, the concept described above has had very little applicability historically.

With this background, the GMAC Working Group was given the following formal charge:

> "The Group should consider options which would allow grantees under some prescribed circumstances to intermingle funds between 'closely related' grants. This proposal should be considered, keeping in mind NIH's experience with the 'identified activity' concept, problems with late cost transfers, and the legal implications of liberalizing policy in this area."

Supplemental guidance to the GMAC Working Group was suggested by Mr. Henry G. Kirschenmann, Director, Office of Grant and Contract Financial Management, DHHS, who asked the Group to consider two key issues:

1. Address the degree to which individually funded grants are, in fact, closely related scientifically.

2. Establish how relatedness, when known in advance of an award, can be reflected in the grant award with sufficient clarity to convey its acceptability to non-scientific reviewers such as auditors, audit resolution staff, and grants managers. Secondarily, consider how relatedness can be effectively determined and communicated when a related project is begun _after_ a given NIH grant is awarded.

In its deliberations, the GMAC Working Group was unanimous on the position that there should be little or no overlap between or among discrete research projects which are submitted and requested as separate and distinct proposals, but there was also a recognition that there are some individual situations where "one identified activity" is valid so long as such a determination is agreed to _in advance_ by all affected parties. After considerable discussion, the Working Group developed the following proposed definition of close relatednesss for purposes of advance recognition of "one identified activity" and with it a sanction to intermingle funds:

> "Closely related projects are ones where the respective specific research aims are interdependent; that is, objectives of one of the projects cannot be adequately achieved without the conduct of the research on the other project or projects."

The Group also suggested that the limited application of this concept should extend to other direct cost categories besides merely salaries. This would require an amendment of the existing _PHS Grants Policy Statement_ language to extend the present coverage.

Criteria was also developed by the Working Group to serve as illustrative factors to help in the determination of close relatedness (Exhibit IV).

It was also recommended that, where appropriate, a post-award determination of close relatedness should be permitted so long as the application and effect of such a determination was prospective. (By contrast, the Group felt strongly that there be no retroactive implications.)

Further, it was recommended that as applicable such determinations should be acknowledged in writing by the Grants Management Officer (preferably in award documents).

The Group recognized that even with the use of its clarifying definition of close relatedness (coupled with the aid of illustrative factors shown in Exhibit IV), there probably would not be a significant increase in the number of projects being identified as closely related or "one identified activity"; however, the definition must be viewed in the context of (1) legislation supporting the Federal sponsorship of health-related reseach through the award of project grants and (2) the Peer Review System goals of supporting only the most meritorious discrete research projects.

The Group concluded by stating that if senior NIH management or others feel that their proposal should be broadened in the interest of adopting more institutional-like support mechanisms (e.g., NSF's Master Grant), they suggest consideration be given to the appointment of a separate Task Force composed of scientific and administrative staff from within and outside the Government to further consider this issue and its implications.

Exhibit I

Unobligated Funds Reported for Selected Types of Grants - FY 1976-80
(Dollars in Thousands)

Type of Award and Year	Total		Percent Unobligated
	Amount Budgeted	Unobligated Balance	
1976			
P01-Program Project	266,756	6,490	2.4
P30-Center Core	81,000	3,879	4.8
P50-Specialized Center	106,907	10,416	9.7
R01-Traditional Research Project	854,666	14,558	1.7
Subtotal	1,309,329	35,343	2.7
Total All Awards	1,694,364	54,673	3.2
% of Total	77.3	64.6	
1977			
P01-Program Project	225,328	5,324	2.4
P30-Center Core	80,283	2,950	3.7
P50-Specialized Center	101,641	3,551	3.5
R01-Traditional Research Project	783,322	12,969	1.7
Subtotal	1,190,574	24,794	2.1
Total All Awards	1,582,489	42,678	2.7
% of Total	75.2	58.1	
1978			
P01-Program Project	236,976	7,302	3.1
P30-Center Core	86,738	2,053	2.4
P50-Specialized Center	110,639	1,489	1.3
R01-Traditional Research Project	918,221	14,929	1.6
Subtotal	1,352,574	25,773	1.9
Total All Awards	1,799,094	43,639	2.4
% of Total	75.2	59.1	
1979			
P01-Program Project	266,906	4,169	1.6
P30-Center Core	98,049	3,674	3.7
P50-Specialized Center	121,298	2,473	2.0
R01-Traditional Research Project	1,137,844	16,853	1.5
Subtotal	1,624,097	27,169	1.7
Total All Awards	2,122,403	53,951	2.5
% of Total	76.5	50.3	
1980 (As of 9/29/80)			
P01-Program Project	293,976	6,807	2.3
P30-Center Core	96,673	3,337	2.5
P50-Specialized Center	123,127	2,976	2.4
R01-Traditional Research Project	1,274,660	24,421	1.9
Subtotal	1,788,436	37,541	2.0
Total All Awards	2,326,094	61,017	2.6
% of Total	76.8	61.5	

Exhibit II

Potential Additional Research Project Awards (R01's) Resulting From Unobligated Balance Offsets

FY 1976-80
(Dollars in Thousands)

Fiscal Year	Unobligated Balance	Percent Unobligated	Potential Additional Research Project Awards (Based on $78,000 Average)
1976	54,673	3.2	701
1977	42,678	2.7	547
1978	43,639	2.4	559
1979	53,951	2.5	692
1980	61,017	2.6	782

Exhibit III

NATIONAL INSTITUTES OF HEALTH
FINAL SETTLEMENT - INDIRECT COST
FY 1966 - 1979
AS OF OCTOBER 1, 1980

FISCAL YEAR	PAYMENTS	COLLECTIONS	NET TOTAL	
1966	$ 1,556,716.71	$ 522,737.00	$ 1,033,979.71	
1967	2,713,912.10	682,194.47	2,031,717.63	
1968	4,134,464.36	805,084.00	3,329,380.36	
1969	6,963,593.70	1,012,233.00	5,951,360.70	
1970	8,957,337.00	746,724.00	8,210,613.00	
1971	11,693,773.25	514,523.19	11,179,250.06	
1972	9,923,190.00	810,273.22	9,112,916.78	1/
1973	8,568,314.72	846,152.66	7,722,162.06	2/
1974	11,869,817.97	586,411.91	11,283,406.06	3/
1975	13,379,039.31	735,909.27	12,643,130.04	4/
1976	15,337,127.49	500,970.13	14,836,157.36	5/
1977	10,419,773.87	364,622.86	10,055,151.01	6/
1978	5,131,579.00	125,461.00	5,006,118.00	7/
1979	233,429.00	8,317.00	225,112.00	
	110,882,068.48	8,261,613.71	102,620,454.77	

RECIPIENT SETTLEMENTS (by EIN)

	Total	Number Settled	Number to be Settled
1/	606	558	48
2/	594	538	56
3/	639	527	112
4/	630	440	190
5/	671	423	248
6/	626	267	359
7/	632	141	491

Exhibit IV

Criteria for the Determination of Closely Related Projects

These criteria are intended to be illustrative factors which help define closely related projects at the same grantee institution within which the transfer of costs may be permitted. These criteria warrant refinement so that the definition is clearly understood by both scientific and business administrators; they are not all-inclusive.

1. As contained in the definition, the scientific objectives of the projects must have a great deal in common so that progress in one is interdependent with or contributes to the progress of the other.
2. The projects involved may be pursuing the same protocol or specific aims but making use of different in vivo or in vitro models.
3. One project may be developing or refining analytical procedures or tests which are critical to the progress of the other project(s).
4. There may be programmatic and/or administrative reasons for the separateness of the grant mechanisms, but for scientific purposes they could just as easily be merged into one funding mechanism.

A NEW FUNDING INSTRUMENT - THE FIXED OBLIGATION GRANT[1]

PROPOSAL

That NIH experiment with the use of a new funding instrument, the FIXED OBLIGATION GRANT. The principal features of use of this instrument would be:

(1) no change in present pre-award proposal process for selection of research and determination of amount of award

(2) change in post-award administration to delegate most of the responsibility to the grantee institution and principal investigator

(3) shift in emphasis of accountability from allowability of costs and adequacy of documentation to reasonableness of technical progress.

BACKGROUND

The emergence of the research universities as the principal performers of basic research is one of the most significant features of the development of the national research effort since World War II. This development was not accidental. It is the result of conscious national policy decisions. The relationship between the government and the universities has been fruitful beyond measure. Through their research collaboration knowledge has grown and research results have been widely and usefully applied. Both the government and the universities have been able to serve society better than either could have done on its own. The synergism of the NIH-university relationships has been especially productive.

Over the past decade disturbing tensions have developed in this relationship. A number of factors which have contributed to this trend have been widely recognized:

- marked change in magnitude of both the research enterprise and the investment of public funds in research
- increase in university size, complexity, emphasis on research, and extent of participation in government-university relationship
- growth in interdependence of government and universities
- certain government-wide policies which are unrelated, or only indirectly related to research

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[1] Prepared by Dr. Linda S. Wilson in consultation with James Kelly.

- persistent economic difficulties which have severely burdened individuals, the universities, and the government.

Three additional factors are, however, less well recognized:

- the government's decision many years ago to support research in universities via adaptation of the procurement process and on a cost-reimbursement basis
- limited sensitivity among participants to the various principles, objectives, and constraints which affect the government, the universities, and investigators

- centralization of certain government processes, such as the audit function and the indirect cost negotiating function.

Because these factors have such a direct bearing on the proposal for a new instrument, some further comments are necessary.

Procurement vs. Assistance

For much of university research, an assistance rather than procurement support mode would seem to be the most appropriate in that Federal support of most basic research is support of a public purpose rather than procurement of specific services. The choice of most appropriate mode for the relationship is important because the rights and obligations of suppliers and contractors in most instances differ substantially from those of assistance recipients. Concepts of competition, performance measurement, accountability, and other requirements are applicable to both procurement and assistance relationships, but they differ in application and underlying philosophy for the two modes. Because these distinctions are not always understood by those who administer Federal agreements for basic research, the treatment of Federal support for research as a form of procurement persists and influences agency policies, procedures and attitudes. In lieu of cooperation and trust, an adversarial relationship and skepticism, and suspicion emerge. "Arms-length" bargaining replaces collaboration.

A key policy question is whether basic research can be most effectively pursued as assistance or procurement. Administrative requirements should be governed by that decision.

Costs and Benefits of the Cost Reimbursement Basis

As the research enterprise has grown, the complexity of management on a cost reimbursement basis, with the allocation and documentation requirements it imposes, has burgeoned. The growth has heightened emphasis on accountability and increased need for assiduous cost recovery efforts. The results are greater costs of financial management and increased incidence of disagreements between university and government personnel on costing issues.

A second key policy question, therefore, is whether the costs and benefits of the cost reimbursement process make it the method of choice for all Federally supported research in universities.

Ignorance, Misunderstandings, and Insensitivities

At least part of the difficulties experienced in the relationship result from the fact that few participants genuinely understand the bases for the expectations and behavior of the government and universities. On the government side there is all too often a lack of sensitivity to the vulnerability of both the academic environment and the research process to intrusion of external requirements. On the university side there is often lack of sensitivity to the vulnerability of support for research to changes in public confidence in research, researchers, and their institutions. There is also surprising lack of appreciation of the extent to which public support of research is based upon the expectation of ultimate practical benefits. Such insensitivities are exemplified by the disagreements about so-called "time and effort reporting," cost transfers, and investigators' need for flexibility to manage the resources allotted to them.

A third key policy question, then, is whether modification of the terms of the research agreements could help improve the relationship while still meeting accountability and support objectives.

Centralization of Government Processes

As the research enterprise grew, various modifications were made. Centralization of the audit and indirect cost negotiation functions was one such change. In the late 1960's the responsibility for these functions for all research agreements at a given institution were consolidated under a single congizant audit agency. Most educational institutions were assigned to DHEW. This change was designed to relieve the problem of multiple audits and negotiations by different agencies at the same institution. One consequence of this change, however, has been a decoupling of financial and administrative accountability from scientific accountability. This decoupling detracts from overall accountability.

The relevant policy question is what is the proper balance between scientific accountability and fiscal/administrative accountability for basic research and how can this balance be most effectively achieved.

High Volume, Retail Process

Finally, it is important to recognize that almost half of all Federal funds (and half of NIH funds) expended for university-based research in FY79 was spent under the traditional small (< $150,000) research project agreements, the backbone of the U.S. support system. Even a very conservative estimate of the number of such individual research project agreements exceeds 20,000. Given this volume of activity, it is clearly imperative that the administrative requirements themselves meet the test of accountability.

OBJECTIVES OF DEVELOPING A NEW SUPPORT INSTRUMENT

The primary and overarching objective is to improve research productivity. Specific objectives include:

- clarification of the mode of support as assistance
- reduction of administrative burden
- improved balance between scientific and fiscal accountability
- improvement of flexibility for investigators to take advantage of scientific opportunities
- improvement of the relationship and understanding between the principal parties:
    - a) the NIH and universities
    - b) universities and the principal investigators
    - c) the NIH and other Federal agencies
- maintaining and perfecting the stability of support through long-term commitment.

CONSTRAINTS

The principal design constraints include:

- maintaining the current arrangement for selection of research to be supported
- adequate assurance of controls against fraud and abuse
- achievement of objectives without increased costs.

A POSSIBLE SOLUTION

A shift away from cost-reimbursement as the basis for support is proposed. Specifically, we propose that NIH experiment with a new funding instrument, the FIXED OBLIGATION GRANT, which would operate as follows:

1. The pre-award proposal process would be the same as for the presently used NIH research project grants (as to nature of proposal, review, and award decision).
2. Post-award administration would differ in that:

a) Full responsibility for management of the funds awarded would be delegated to the grantee institution with the understanding that

   (1) the funds would be handled in accordance with established institutional policy,

   (2) expenditure of the funds would require principal investigator approval,

   (3) the following changes would require prior agency approval

      i) change in scope

      ii) change in principal investigator

      iii) change in institution

      iv) significant change in principal investigator's level of effort

b) Only technical reports would be required by NIH. No financial reporting to the Federal government would be required.

c) Time and effort reporting would be restricted to the needs of the institution and to the needs for developing indirect cost rate proposals. Such reporting will not be required for project by project accounting.

d) Audits would be for the purpose of assessing compliance with pre-conditions of grants, to develop information needed to negotiate prospective direct costs (such as patient care costs) and indirect costs. The institutions' financial systems would be subject to periodic audit by Federal or independent auditors to assure that the systems have adequate controls against fraud.

The principal focus for accountability therefore would be shifted from determination of allocability and allowability of costs and the adequacy of their documentation to the reasonableness of technical progress made. At the same time, the arrangement provides adequate controls to protect public funds.

NOMENCLATURE

A number of names have been suggested for this new instrument, such as fixed price grant, lump sum grant, fixed sum grant, and grant-in-aid. Each of these terms seems to have connotations that are misleading. For example, the term fixed price grant includes the word price, which is a misnomer since it is not intended that a price will be set. It also seems to evoke expectations that the nature of the support is procurement. It raises expectations that the terms of the agreement would be closely similar to those of a fixed price contract which is not very appropriate for basic research because the outcome is unpredictable.

The term proposed, fixed obligation grant, is intended to convey the primary change in what determines the actual amount provided by the government: a change from actual costs incurred to a pre-determined agency obligation. It should be noted that under the presently used cost-reimbursement grant, the award amount is a ceiling on allowable costs which may incurred. The opportunity to negotiate an increase in costs is quite limited.

The major shift, then, is away from prior agency approval requirements for changes within the budget and away from agency monitoring of costs and their documentation. The rationale for this shift is that the extraordinary care given to the selection of research projects to be funded, and the critical role which past performance plays in the decision for renewal of support, provide substantial scientific accountability. This allows experimentation with approaches to fiscal accountability which take advantage of incentives and checks and balances within the institution rather than externally imposed administrative controls.

DIFFICULTIES TO BE ADDRESSED

Four specific difficulties must be satisfactorily addressed in order for the fixed obligation grant to be feasible.

1. In severe inflationary periods, some accommodation may be necessary to respond to significant cost increases (to keep current with institutional salary policy and indirect cost rates), during the course of multi-year awards.

   A possible approach to overcome this problem includes annual renegotiation of the amount of the agency's fixed obligation. Such increases would be prospective, not retrospective.

2. Under a fixed obligation award, unexpended funds at the end of the budget period would remain with the grantee. In the past NIH has used the unobligated balances from its grants to amplify the extent to which new awards can be made and to make adjustments for increases in indirect cost rates. For traditional research project grants (RO1's), unexpended balances are surprisingly stable. Over the years 1975-1980, they averaged 1.6% of total RO1 obligations. (Range: 1.4% to 1.8%) The total amount of such unobligated balances ranged from $8.9 to $17.1 million and averaged $14.2 million. The percentages for program project and specialized center grants are higher, but the dollars involved are smaller.

   NIH uses approximately one-third of the total amount of unobligated balances to make indirect cost settlements. Roughly $9-10 million has therefore been available to use for new RO1 awards. Assuming an average size award of $100,000, 90-100 additional awards/year have been made using funds from unobligated balances. If such balances remained with the grantee for work under the same scope, fewer new awards would be possible.

One approach to this problem would be to negotiate adjustments in budgets at the time of award, to reflect estimated potential savings resulting from delayed start of projects (due to delays in filling positions). The savings from first year awards would then provide the resources for necessary adjustments in non-competing continuation awards and for new awards.

More detailed analysis of the experience with RO1 grants by type of award (non-competing renewal or renewal) and by Institute, type of institution, field of science, should yield a better idea of whether the amounts involved are large enough or predictable enough to make this a feasible approach.

The critical questions are:

a) What provides the greatest incentive for prudent management of the research funds by the investigator and grantee institution?

b) What is the simplest administrative mechanism for dealing with the combination of problems 1 and 2 outline above?

c) To what extent is increasing the number of new awards a useful and wise goal if doing so undermines productivity of continuing research?

3. The shift in locus of responsibility for management of the funds to the grantee institution will perturb present investigator-institution and investigator-NIH relationships. (Some investigators prefer to deal with NIH.)

Given the fact that the institution must authorize the original proposal and accept the award, there is a basic budget agreement between the investigator and the institution. What will have to be worked out is what kinds of changes an institution will allow. Requiring investigator approval for expenditures and requiring consistency with established institutional policy should provide good boundary conditions. What will be needed is careful examination of institutional policies, clear communication of the policies to investigators, and opportunities for investigators to participate in discussion of modification to institutional policies.

4. Adjustments will be needed in the way indirect cost proposals are developed. Expenditure data, but not effort/activity documentation will be available for salaries charged to fixed obligation grants. A deviation from strict application of A-21 will therefore be necessary. For indirect cost activities either the National Commission's proposal of a "fixed percentage" for that particular component of the indirect cost rate or the AAU-OMB experimental statistical approach could be pursued. If the fixed obligation grant seems feasible and advisable, adjustments in indirect cost calculation procedures can be worked out.

EXPERIMENTATION

The National Commission on Research has recommended experimentation with a new funding instrument of this type. An experiment in the sense of a trial with a control group and quantifiable indicators of outcome is probably not feasible. What can be explored is subjective experience in different Institutes (which have varying management styles) and different types of grantee institutions. Responses of agency scientific officers and investigators about flexibility, productivity, and administrative burden change would be sought. Perspectives from institutional officials and agency grants management personnel will be important. Varying approaches to handling unexpended balances and cost increases could also be pursued.

It must be recognized, however, that it may not be possible to prove that the fixed obligation grant is as good as or better than the cost-reimbursement grant. But neither can the converse be proved. They simply represent different approaches to a set of objectives.

October 20-21, 1980 Meeting

of the

Advisory Committee to the Director, NIH

THE ORGANIZATIONAL GRANT

The Model of the Biomedical Research Support Grant (BRSG)

by

John F. Sherman, Ph.D.

John F. Sherman, Ph.D.

THE MODEL OF THE BIOMEDICAL RESEARCH SUPPORT GRANT (BRSG)

Background

On January 27, 1960, the then HEW Secretary Arthur Fleming sent Speaker of the House of Representatives, Mr. Sam Rayburn, a letter in which there was proposed the establishment through legislation of a "new series of grants-in-aid to public or non-profit institutions for the general support of their research and research training programs in the field of medical and health-related research." The Secretary's letter had been preceeded by a considerable amount of discussion within the Executive Branch, based on a proposal developed earlier by NIH. The genesis of the concept had been derived from numerous discussions with individuals in the scientific and academic communities as well as the conclusions from three major studies. Those were the (HEW) Secretary's Consultants on Medical Research and Education, the so-called "Bayne-Jones" Report; the President's Science Advisory Committee Report entitled "Strenghtening American Science;" and a 1958 study by NIH of a sample of twenty medical schools which was a part of the Agency's appraisal of the impact of its support program on grantee institutions.

Although the total research grant program of the NIH for FY 1959 approximated only $142 million, there was already the perception that the predicted substantial expansion of the research program would not realize its full potential unless certain precautions were taken to assure careful evolution of both the research effort and the institutional forms in which the research would be conducted. The proposal for the new program recognized several contemporary or probable future circumstances:

- A *de facto* decision had been reached that primary reliance in the implementation of the research effort had been placed on an interdependent relationship between the federal government and the Nation's research-oriented academic institutions.

- There was recognition that these institutions were multi-purpose in nature whose programs were supported from a variety of public and private sources.

- Predictably, there would be a degree of uncertainty for the institutions in the outcome of their biomedical research investigations and funding based on a nationally competitive project grant system.

- Because of the probable rapid expansion in the size and diversity of the research enterprise, there was the necessity of assuring improvements in the managerial capability of the grantee institutions, paralleling the growth of research activities.

- Assuming an eventual biomedical research effort at the national level of considerable size, scope and depth, attainment of maximum effectiveness would be facilitated by the provision of comparatively small amounts of flexible research monies as a supplement to the project grant program.

On January 13, 1961, President Eisenhower outlined a series of guidelines for the new program in a memorandum for the Secretary of Health, Education, and Welfare; and the program was initiated in FY 1962. Several points are worth noting about its initial character:

- The formula devised for distribution of the funds involved a threshhold, in addition to a taper and a ceiling, so that there would be assurance of significant research activity as a basis for eligibility and the avoidance of a circumstance wherein there could be the accusation of a program where the rich get richer and the poor get poorer.

- The initiation of the program permitted the phasing out of several ancillary grant activities, most notably the so-called small grant program which had been in operation for a number of years and which was used to provide on a comparatively rapid basis small sums for the support of young investigators or pilot projects.
- Initially, the funds were provided by a formula-based transfer to a central NIH account from each Institute's appropriations. The authorized ceiling was established at 5% of the total sum available for research grant activities in that fiscal year, 10% the second year and 15% in the third and subsequent years.
- Although there was considerable support among institution and organization executives for the new program, less enthusiasm and sometimes outright opposition, then as now, characterized the attitude of some faculty and faculty-oriented organizations as well as Institute program officials, based largely on their fear of significant diversion of funds from the peer review project grant system.
- Because of a somewhat similar program in the National Science Foundation, guidelines were established to be certain that duplication of effort and awards from the two programs would be avoided.

It is of some historical interest that a companion program also designed to assist in the stabilization of the rapidly expanding research enterprise, the so-called Career Research Professorship program, proposed for initiation at the same time, never left the launching pad. Irreconcilable differences developed during the development of the program between the purposes and prerogatives of potential awardee institutions and the objectives of the agency, despite the laudable purposes of the award.

The Evolution of the Program

While initially supported in reasonably positive fashion by most elements of the Executive Branch, there was continuing questioning by some officials in higher echelons as to whether this program was indeed a desirable and necessary adjunct to the NIH research project grant system. As a consequence, the life of the program has been a rather tenuous one. As reflected in the figure shown, the proposed level of operation for the second year of 10% was never reached, to say nothing of the ultimate ceiling of 15%. Instead, the highest percentage was reached in FY 1969 at 8.3%, with a steady decline since that time to the level of approximately 2.2% in FY 1980. On several occasions, only vigorous efforts by the NIH and outside groups working with the Congress have saved the program from total extinction. At the same time, numerous studies have been conducted on the program, usually under the sponsorship of NIH. There are major difficulties in assessing the direct value of this type of award. Fortunately, there has been sufficient anecdotal evidence, together with what appears to be a logical justification for multi-purpose institutions having access to a source of limited but highly flexible funds to offset the negative characteristics of the project grant-based system, to permit continuation of the program. As pointed out in the extensive study in 1976 of the various programs of the Division of Research Resources, it seems rather doubtful as to whether an expenditure of time and resources necessary to provide more detailed proof of accountability would merit the investment of those resources for that purpose.

As both the overall research effort and the now designated Biomedical Research Support Grant program matured, numerous changes were instituted in the operation of the program. The first, interestingly enough, was the elimination of the two-for-one incentive designed originally to increase funding from non-federal sources. Although that objective was partially achieved, it came at a cost, as NIH later discovered. As Joe Murtaugh, one of Dr. Perpich's predecessors, observed at the time, "We have succeeded in placing a premium on administrative shrewdness rather than on scientific excellence." The problem was that a significant number of institutions shifted funds in various fashions, including newly established foundations, so as to maximize the funds obtained from outside sources in ways that appeared contrary to the spirit of the original expectation. A second and subsequent major change resulted from complaints or criticisms from the faculty at some institution that the awards had become "Deans' kitties," with no formalized procedures for allocation of the funds and little input by scientists in that institution. As a result, new requirements were promulgated as to the manner in which the grants would be administered, including a system of local peer review for the distribution of the funds. Examination of annual reports over a period of years revealed a pattern of considerable dependency on these funds by some institutions for long-term support of tenured faculty. It was concluded that this was not in the intent of the award nor in the best interests of the financing of those needs; therefore a limitation was established that salary support for such individuals from the grant should be limited to temporary situations. Although the overall consequence of these changes has been a steady erosion of the initial degree of flexibility in the expenditure of funds by grantees, it would appear that these changes, at least to date, have not been overly restrictive. In all probability, they were justified if only on the basis of avoiding or refuting criticisms of the program's operation, especially from the Office of Management and Budget and in some quarters of the Congress. It should be noted as well that the once flourishing companion program in the National Science Foundation was terminated long ago, despite a general sense in that agency that such a program is both merited and desirable. They have been unable to re-establish a successor.

The Current Program

Although some circumstances with respect to the program and others apart from its operation have changed since the early sixties, it would seem that in general the objectives as well as the justifications described at the initiation of the program still merit the continuation of such an activity. There seems little doubt but that most of the extramural funds from NIH will continue to be awarded through a system of nationally competitive project grants awarded after centralized peer review. Thus the need persists for some capability under the institution's control to offset the resulting disadvantages to the grantee of such a system. There is the need for some arrangement whereby prompt action can be taken to exploit emergent research opportunities discernable only at the local level or to encourage the development of young investigators who are not yet able to compete for full-scale research project support in national competition. There arises more prominently than ever with increased competition for the available research funds, the desirability of some complementary device to finance centralized research resources within an institution as an economical means to provide necessary resources such as animal facilities or large-scale instruments to be used by a variety of investigators within a given situation.

Difficulties continue to plague those who champion this cause, especially in the context of flexible funds being used in an institutional environment with multiple purposes and multiple sources of support. The plateauing of funds appropriated for the program as measured in current dollars has forced a reduction of the maximum size of the grant and has actually penalized those institutions most heavily engaged on behalf of the Nation's biomedical research effort. At the same time, the justification for further expansion of the size of the total research effort is more and more difficult to establish.

The Future

This Division of Research Resources in its Five-Year Plan for FY1982-1986 has developed a plan for the BRSG program in which there are several considerations which receive particular emphasis and deserve thoughtful consideration by all interested in or affected by this program.

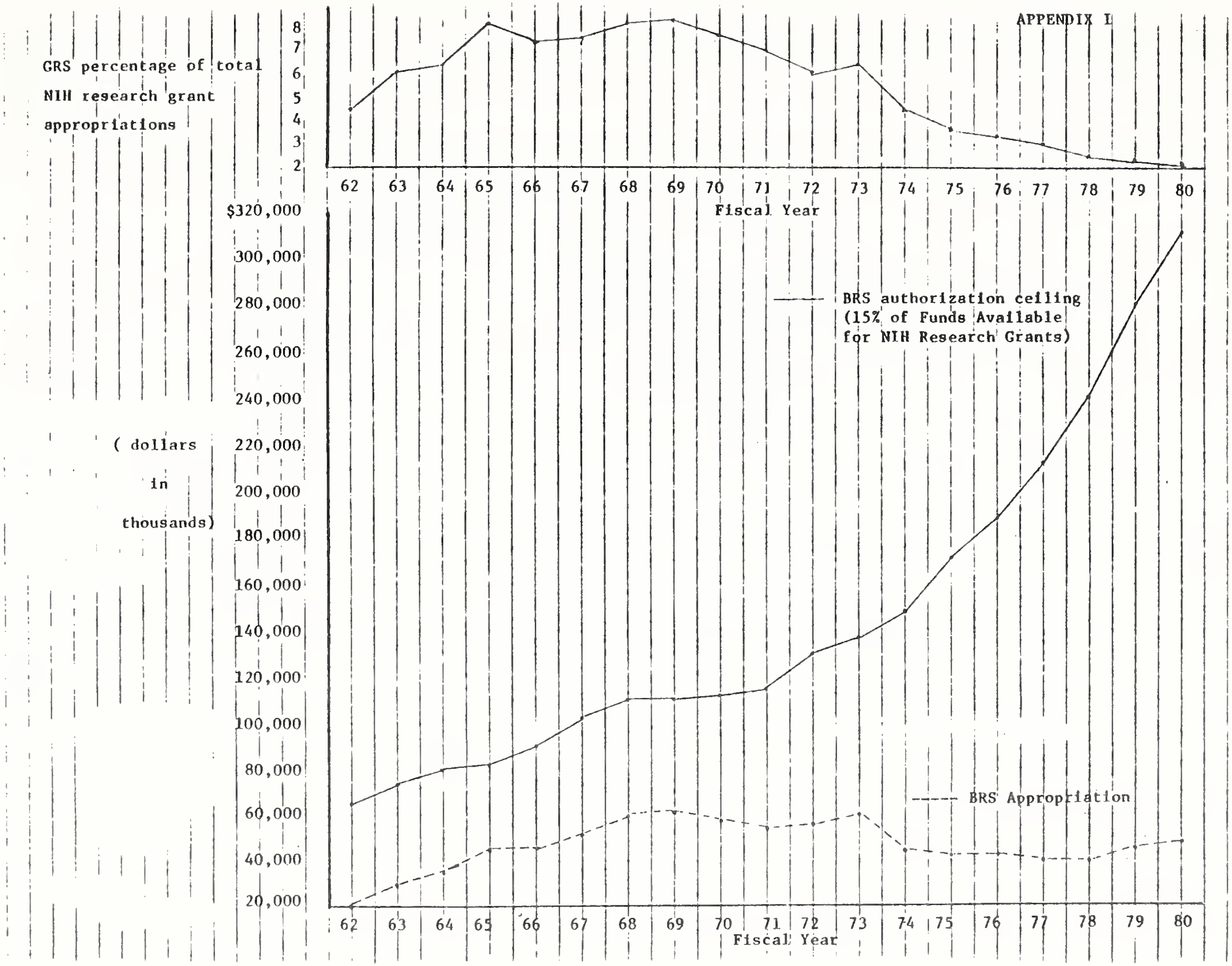
- There is the need to reverse the decline in the funds allocated for this type of award. A grant up to $200,000 can be extremely valuable, given the flexibility in the use of the funds, even though that represents an almost minuscule proportion of the institution's total biomedical research expenditures. However, the value of this support instrument is severely diminished by the comparatively small appropriation for the program.

- The formula used to compute BRSG awards is structured in such a fashion that those institutions most heavily engaged in biomedical research are unduly discriminated against in the distribution of available funds. There is a definite need to re-examine the formula although a taper in the formula as well as a ceiling should be retained.

- With increases in sums available for research largely due to inflation, there is the need to re-examine the threshhold amounts established for determining eligibility for the program.

- An intriguing use of the BRSG authority is suggested in the Five-Year Plan for contending with the problems of financing of major research instruments.

APPENDIX I


GRS percentage of total
NIH research grant
appropriations
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60,000
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20,000
(dollars
in
thousands)
BRS authorization ceiling
(15% of Funds Available
for NIH Research Grants)
BRS Appropriation
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Fiscal Year

APPENDIX II

BIOMEDICAL RESEARCH SUPPORT GRANTS

NON-ALLOWABLE COSTS

CUMULATIVE SUMMARY BY DATE OF POLICY STATEMENT

August 1961	October 1962	September 1963	December 1964	July 1966
Construction	Library Support	Fringe Benefits Unless Treated as Direct Cost	Indirect Costs	No Change
Alteration and Renovation	Entertainment	Research Administration		
	Payment to Federal Employees	Travel Not Related to Research, and Any Multi-Purpose Travel		
	Telephone & Postage	Salary of Program Director for the Grant or Other Administrators		
	Fringe Benefits to Tax Exempt Trainees	"Because this grant is designed to complement rather than displace other Public Health Service awards, institutions are urged to apply for specific research project grants and research training grants as soon as the appropriate activities are sufficiently mature."		
	Property Taxes and Insurance on Equipment			
	Petty Cash Funds			
	Consultant Fees to Employees of the Grantee Institution			
	"It would be an undesirable waste of the flexibility of this grant to employ its funds in aid of activities which can be supported by any other research grants and training programs."			

BIOMEDICAL RESEARCH SUPPORT GRANTS

NON-ALLOWABLE COSTS

CUMULATIVE SUMMARY BY DATE OF POLICY STATEMENT

August 1968	July 1974	December 1976	December 1976 (New Requirements)	April 1979
Fringe Benefits, and Alteration and Renovation No Longer Prohibited	Insurance and Property Taxes on Equipment No Longer Prohibited if Treated as Direct Costs	Training	Program Director for Each Grant Must Employ a Mechanism to Provide Advice on Allocation of BRSG Funds	Foreign Travel
Prohibition of Payments to Federal Employees Revised to Allow Exceptions in Effect for Other NIH Grants		Supplementation of Federal Trainee Stipends	Program Director for Each Grant Must Employ a Mechanism to Insure That the Availability, Allocation, Status, and Accomplishments of the BRSG award is Known Throughout the Grantee Insitution	Public Relations
Broad Institutional Planning That is More General Than Planning for a Specific Project		Cost Overruns		Restriction on Research Salary for Tenured Faculty Extended to "Equivalent Scientists" at Non-Academic Institutions, and Revised to a Limit of Six Months in Any Four Consecutive Grant Years.
Support for Pre-baccalaureate Students		Administrative Travel Including Travel to Seek Grant Support		Support of Research Other Than to Develop New Knowledge About Fundamental Processes Related to Health May Not Exceed Ten Percent of the BRSG Award for the Same Grant Year
		Research Disapproved By the PHS		
		Research Administrative Costs No Longer Prohibited if Treated as Direct Costs		
		Supplementation of Another PHS Research Grant, Except for Unexpected or Emergency Needs Not Covered By the Other Grant cf.1962		
		Research Salary for Any One Tenured Faculty Person Limited to Cumulative Total of Six Months in Any Two Consecutive Grant Years		

The Organizational Grant "Sloan-Kettering" Model[1/]

The National Cancer Institute on January 1, 1966 inaugurated a trial of a new and somewhat controversial extramural funding instrument. On that date it replaced all NIH support at the Sloan-Kettering Institute for Cancer Research (SKI) with a single cost-sharing grant. Awarded in the amount of $22.6 million over a 5-year period, this omnibus grant was intended to provide partial support, with minor exclusions, for SKI's entire research and training program. The uniqueness of this grant lay not in its having replaced a multigrant/contract arrangement, but rather in permitting the grantee institution to make its own decisions as to the particular research activities to be carried on with Federal support, as well as the extent and duration of such support for these activities.

Single instrument support did not suddenly appear as a full-blown operational concept. For a number of years NCI had been exploring alternatives to the traditional project approach for research within the larger cancer institutes. Intermittent discussions on this subject between NCI and SKI, for example, dated back to 1956 when Dr. C. P. Rhoads, then head of SKI, discussed with the National Advisory Cancer Council a modified form of single instrument funding. NCI's explorations were prompted by perceived limitations in the existing project system. As reported in the Senate appropriations hearings for FY 1966, NCI believed that "large numbers of individual projects tend to fragment financially and operationally the endeavors of segments of the organization." It was felt, too, that detailed project funding could result in merely labeling support rather than creating true additions to the research of the organization. In addition to making it difficult for the institution to manage, coordinate, and control its activities, the project system was seen as expensive in terms of administration and accounting.

The origins of the single instrument concept, in the form finally adopted in 1966, can be traced to a report submitted by NCI in 1960 to the Congressional Appropriations Committees. The report articulated a philosophy and definition for cancer research centers, and proposed a long-range program for their development. Pertinent to the topic at hand was an observation in that document that since "the support under this program would be for institutions rather than individuals, the type of review given by advisory bodies would be fundamentally different from the usual type of review given the customary project grant application." Furthermore, it continued, "the reviewers would be selected for their ability to judge research organizations broadly, both as to administrative management and scientific program and achievements." Finally, prophetic of current concerns, the report paid obeisance to "assurance of appropriate accountability" and suggested, with respect to continuity and stability of support, a version of what has come to be known as roll forward funding.

[1/] Prepared by Dr. Samuel S. Herman for presentation at the 41st meeting of the Advisory Committee to the Director, NIH, October 20-21, 1980.

Preaward Preparations

Inasmuch as almost 15 years have elapsed since activation of the SKI single instrument grant, it may be useful to recall at this point the thinking and events that immediately preceded that step. Following discussions with the National Advisory Cancer Council, the Congressional Appropriations Subcommittees, and at upper Department and Public Health Service echelons, a decision was reached in mid-1965 to proceed with development of this funding instrument. In addition to drawing up a plan for SKI, NCI staff was instructed to document the case fully because of its potential adaptability to other large centers. Accordingly, staff studies examined the comparative advantages of single versus multiple instruments of support to both the sponsor and performer, whether the instrument should be a grant or contract, etc. Those studies made it clear that the concept had much to recommend it, and that such problems as it did present could all be resolved. It had, indeed, an overriding virtue--that it obviously fitted the increasing need to decentralize scientific and administrative decision-making to the level at which decision-makers must live with the consequences of their decisions.

Selection of institution. It became immediately apparent that the agreement of support would have to be negotiated with care and, in effect, be "tailor-made" for each institutional participant. Clearly, the identity of the institution was critical, since the totality of its program would have to be such that it could be supported under the NCI's statutory mandate. A number of factors combined to make SKI appropriate for testing the effectiveness of single instrument support, as well as its applicability to other cancer research institutions:

(1) Since the founding of SKI in 1945, NIH had contributed to the support of its research program. Although the support in dollars had grown appreciably over the years, the relationship of NIH funds to the total operating expenditures of SKI, expressed as a percentage, had remained surprisingly constant.

(2) SKI's sole mission was research and research training in the field of cancer, eliminating the complexities of cost accounting that would be encountered in dealing with hospitals and medical schools, where part of the costs were devoted to noncancer activities and where there were major functions in the area of health services and medical education.

(3) It had a well-structured administration, and it had developed sophisticated management concepts for its cancer research program.

(4) Grant support had attained a size and scope that made it difficult for NIH advisory groups to deal with on a piece-by-piece basis.

Advantages. Staff studies had suggested a variety of potential benefits for NIH and the recipient institution in single versus multiple instruments of support, including the following:

(1) NIH would be able to review an institution's program at one time, as a whole, thereby obtaining a more comprehensive understanding of its scope and direction than was possible under the prevailing pattern of review of isolated program segments by various Institutes, Advisory Councils, and study sections at long and variable time intervals. Consequently, NIH would have a more realistic view of what its funds were actually supporting.

(2) A single cost-sharing instrument would promote management efficiency, permitting the institution to plan and conduct its research as an integrated program, rather than as a group of separately presented, variously supported individual projects. Moreover, it would provide an incentive for the institution to deploy its total resources for this purpose according to its own judgement of program needs, free from the inflexibilities of individually funded projects.

(3) The reduction of numerous applications to a single document, however complex, would relieve the paper-preparation load of the applicant and, in turn, the paper-processing load of NIH.

(4) Single instrument support would permit prompt initiation of investigators' proposals, in contrast to the usual hiatus of about nine months required by the review process at NIH.

Grant or contract. The advantages cited above would accrue whether the single instrument were contract or grant. Staff consideration of this topic, however, underscored three drawbacks of the contract mechanism. First was the complexity and rigor of Federal procurement regulations concerning change in the terms of awarded contracts and their auditing. Second was the possibility that some future NCI appropriation could be so drawn as to limit contract--but not grant--funds. A third disadvantage was the unattractiveness of the implication created by the nature, even if not the actual language, of a contractual relationship, to wit, that the contractor becomes an agent of the Government. This last factor seemed particularly inappropriate to the objective of enlarging the recipient institution's autonomy and of maintaining a general surveillance by review of the total program in broad outline rather than in detail. In contrast to these shortcomings, the grant instrument seemed to offer maximum freedom in the pursuit of research. Also, grants were about to shed their one serious deficiency for this type of operation--the percentage limitation on amount of reimbursable indirect costs. For these and other considerations, the grant was selected as the funding vehicle.

Legality. The legal authority for making such an award was for a time in dispute. The Office of the General Counsel did not agree with NCI's suggestion that the proposal constituted a "project" grant within the meaning of the first portion of the then section 301(d) of the Public Health Service Act. The proposal, in their view, should be considered within the authority provided by the last portion of that section to make general research support grants on the recommendation of the National Advisory Health Council. NCI had difficulty with that option inasmuch as the proposal involved only cancer, and needed to be programmatically evaluated in that context, and hence, was a responsibility of only the National Advisory Cancer Council. NCI's reservations were fuelled also by a concern that under the General Research Support program rules the grantee institution would not be bound to adhere to the agreed purposes of the grant. In addition, the formula support concept used for general support grants would be negated by including the proposed single instrument grant.

In the light of these difficulties of classifying the proposal, it subsequently occurred to the General Counsel that NCI was not restricted legally to a choice between the "research project" category and the "institutional" support category. In the light of certain decisions by the Comptroller General, it appeared that Congress had provided a third approach that could be appropriate to invoke in this instance. That approach involved the authority of the Surgeon General, upon recommendation of the National Advisory Cancer Council or other appropriate Council to "adopt...such additional means as he deems necessary or appropriate to carry out the purposes" of section 301---that purpose being in general the conduct and support of health research.[2/] The Surgeon General ultimately relied on that authority to approve the SKI award, an action which, as we shall see below, would kindle controversy from another quarter.

Grant application. SKI requested a 5-year grant which would consolidate NIH's 41 grants and 3 contracts, and which would be renewable two years prior to termination. The amount requested for the first 12 months was $4.3 million, or 47.1 percent of the applicant's total allowable operating budget of $9.1 million. The request for the first year represented a projection of NIH's FY 1966 level of support to this institution. Hospitalization costs related to SKI research would be supported by separate grants for which the Memorial Hospital, a separate corporate entity, would have to compete in the future. The applicant projected over the 5-year period a relatively stable budget, not exceeding $10 million. The funds requested for the succeeding two years, using the 47.3 percent cost-sharing figure, were actually less than the amount that would be awarded under the existing grant commitments from NIH. The grant budget, as proposed, would reach a level of $4.7 million in the fifth year.

2/ This authority under what was section 301(i) of the Act went beyond the use of new methods or mechanisms of support, with which we are here concerned. In a March 4, 1964 opinion to the DHEW Secretary, the Comptroller General, for example, viewed that section as providing authority for grants to support communication of research information to practitioners and the public.

In advance of submitting the grant proposal, SKI had prepared a detailed outline of the information to be included in the application. The outline was fully discussed with NCI staff in order to ensure the inclusion of information believed to be essential for reviewers to arrive at a recommendation on the proposal.

Initial review. Initial review of the application was accomplished by an outstanding ad hoc advisory group which met at the site for three days under the chairmanship of Harold P. Rusch of the University of Wisconsin. Also participating throughout the entire meeting was a representative of the National Advisory Cancer Council. Since the projected review involved concepts fundamentally different from those characterizing the review of traditional grant applications, an extensive effort was undertaken to provide members with background information. An orientation statement outlining the rationale for single instrument support and describing guidelines for initial review of the application served as the basis for briefing conferences with individual members prior to the site visit. Also, arrangements were made for one of the consultants to spend a whole day in advance of the site visit studying the system of fiscal control and the administrative apparatus of SKI. Conclusions and recommendations were based upon discussions organized around: (1) organizational, administrative, and fiscal aspects; (2) SKI's achievements, status, and promise in cancer research; and, (3) the scientific review process at SKI. The ad hoc committee unanimously recommended approval in the amounts and time requested by the applicant, with conditions which were later incorporated in a Memorandum of Understanding that became part of the terms of the grant.

Continuing Review and Evaluation

In accordance with a recommendation of the of the National Advisory Cancer Council, a permanent review committee was established. Designated the Cancer Special Program Advisory Committee, its sole mission was continuing review of this large multidisciplinary cancer research program and determination of the effectiveness of the single instrument grant for partial support of such a program. A full-time staff member was appointed to serve as executive secretary and concurrently as program director for the grant. Also, a grants management specialist was detailed to committee staff to assist in the fiscal monitoring. As developed by the committee, its evaluation procedure would be directed at the following four aspects of the total SKI effort:

(1) the quality and quantity of the research and training programs;

(2) the morale and intellectual environment;

(3) the scientific and fiscal/administrative policies and practices; and,

(4) the capabilities of the SKI administration to develop and maintain a relevant and productive cancer research program.

The evaluation was to be based on a variety of criteria, including general orientation of the research program, professional staff turnover, opportunities for younger staff to assume increased responsibility in leadership, recognition of staff competence and accomplishments by the scientific community, logic of the administrative organization, etc.

Development of information. Information concerning these criteria was developed through the combined efforts of members and staff, with complete cooperation on the part of the grantee. The SKI Annual Report of Research Progress, the research plans for each subsequent year, periodic special reports, and letters of information from the Principal Investigator relative to professional staff changes were utilized to the fullest extent. Supplementary information was acquired through visits and conferences with SKI officers and staff, and by attendance at program review and administrative meetings. Also, studies and reports were prepared by staff on selected scientific and administrative matters.

In this process, the Committee developed considerable knowledge of the functional research sections, and became familiar with the administrative policies and procedures in the management of funds, personnel, and space. Of special importance, the committee studied in detail the SKI program review system, particularly the functioning of the Board of Scientific Consultants. It was therefore able to judge the effectiveness of the system and its influence on the direction of the research program. The results of this continuing review and evaluation, and the committee's judgments developed from its deliberations, were periodically reported to the NCI Director and the National Advisory Cancer Council.

Conclusions. The Committee identified some areas of concern, such as a correctable weakness in the disciplinary composition of SKI's external Board of Scientific Consultants. The dominant tone of its findings, however, was decidedly favorable. Under the single instrument grant, the committee concluded, the development and maintenance of a broad program in cancer research of generally good quality and relevant to current knowledge and research direction had been enhanced by permitting the SKI administration to utilize its resources according to its own scientific and fiscal judgments of needs. As a consequence, the research direction of the total program was structured to accommodate current concepts and trends in cancer research; ongoing productive programs were adequately supported; non-productive programs were phased out; and, new programs were initiated. This resulted in significant contributions to basic knowledge of the cancer problem and to the clinical management of cancer patients, thereby substantially aiding NCI's total mission. In the committee's judgment, the move by NCI to delegate responsibility for program evaluation and management decisions to the grantee institution was wise and reflected a maturity of administrative judgment.

Fate of Single Instrument Grant

In its 5th Year Report the committee recommended continuation of the single instrument grant, if SKI wished to retain that type of support. Somewhat earlier

Dr. F. L. Horsfall, the Principal Investigator, had communicated SKI's intention to seek renewal of the grant until 1977. With the untimely death of Dr. Horsfall in early 1971, however, SKI decided to request only a 1-year extension beyond the committed period of support in order to provide time to make changes in accordance with the wishes of a new Principal Investigator. Upon assuming directorship of SKI in July 1972, Dr. R. A. Good decided to return to a multigrant/contract arrangement. The basis for the change was his concern over the restrictions on supplementation and on seeking other support within the Public Health Service. Accordingly, a plan was worked out for an orderly transition to a core grant and as many as eight program project grants.

Comment

Summing up the seven years of experience with this mode of institutional support, one may conclude:

(1) The single instrument grant can be considered as an appropriate and workable means for providing financial support for a total research program oriented to a categorical disease or a common research problem. As borne out at SKI, it permits flexibility in the management of program and funds, with the result that the total research effort of the institution can be more advantageously accommodated to changing research requirements and trends.

(2) It seems particularly suited to a freestanding institute. An independent cancer research center, for example, is particularly vulnerable to changing funding patterns of agencies from which it derives its support. Such an organization utilizes full-time career staff devoting virtually all of its time to research. Since it is not possible in these centers to relieve fiscal strain through reassignment of personnel from sponsored research to teaching or to income-generating clinical activity, the stability afforded by single instrument support would be of particular value.

(3) Use of the single instrument model for a university-based center is likely to encounter difficulties. One is the potential conflict between the center's overriding need for flexibility and the equally compelling need to keep its activities and policies from disrupting the parent institution. NIH should exercise extreme care that such centers not weaken grantee institutions, particularly since the existence of other specialized centers under the same corporate roof could have a tendency to fissure the parent institution. Moreover, fiscal and administrative management systems would probably be less adaptable to meet the needs of the funding agency. The expense of adaptation would be difficult to justify for a grant, which despite its absolute size, were still a small part of the institution's total resources. Further, such a grant to a university could create problems of "balance", as well as potentially awkward administrative situations, for the grantee institution.

(4) Future grants of this type should incorporate a provision for annual fiscal adjustments. Such adjustments could be made through staff negotiation based on the review committee's recommendation and a percentage level of support established by the National Advisory Council. Other restrictions, such as that which prevented a researcher from moving an ongoing NIH grant if he/she were to join the SKI staff, would probably require modification.

(5) The consequences of young investigators' not being put to the test of peer review of their work at a national level probably requires further study. In a related vein, information is needed on the extent to which a young investigator without peer reviewed project grant support may be handicapped in his/her mobility.

(6) Information is also needed on whether the relatively large size of a single instrument grant might serve as an obstacle for the grantee's obtaining other funds from individuals, foundations, and similar sources.

(7) The core grant for support of cancer centers, first utilized by NCI in 1962, had matured by 1972 into the principal funding instrument for meeting requirements of section 408 of the National Cancer Act of 1971. The concept of a core grant for key investigator salaries, centralized services, research resources, etc., associated with project and program project grants now offers an effective way to fund large and complex center-type programs while retaining traditional NIH peer review and grants management procedures. This development may have rendered less compelling the justification for single instrument support.

Legislative Considerations

Three issues that arose in connection with the SKI award would probably come up again in discussing further use of the single instrument.

(1) The SKI award established a precedent for NIH extramural programs. The extension of such support would necessarily have the effect of constricting the availability of grant funds to the detriment of individual investigators and less well-known institutions. The House Committee on Government Operations in late 1967 characterized this as a development deserving of careful study from the standpoint of national policy. The Committee recommended against further use of this mechanism in the absence of full consideration within the Executive Branch and formal authorization by the Congress.

(2) The same House Committee report commented also that the grant was awarded under a long-standing provision of the PHS Act which had been

enacted many years earlier under very different conditions. Noting that under similar circumstances DHEW had requested an amendment to the PHS Act in 1960 to initiate the General Research Support program, the Committee questioned the award of the SKI grant without specific statutory authorization.

(3) If the single instrument grant were to be used again under the same authority as for the original SKI award, it would be important to develop criteria or guidelines for determining the conditions under which applications could be approved. In addition to the internal administrative need for such criteria or guidelines, their establishment would be an essential element in assuring equitable treatment of applicants for grants under this authority.

Federal Funding in Materials Research

James G. Ling and Mary Ann Hand

The relative merit of granting federal research funds to institutions rather than individual investigators has been a subject of controversy for some time. The recently formed National Commission on Research has included alternative funding mechanisms as one of the issues to be studied. This article summarizes the findings of a Mitre Corporation study performed between 1976 and 1978 on the Materials Research Laboratory (MRL) Program for the National Science Foundation (NSF). The study compared technical publications and other products of 16 MRL's, which had been funded with institutional grants, against similar material from individually funded research projects at 15 other universities (non-MRL's). Two universities funded with institutional grants by the Department of Energy (DOE) for materials research and two funded by the National Aeronautics and Space Administration (NASA) were also included in the study. In addition, the study compared total administrative costs (government plus university) per grant dollar for institutionally funded projects and those funded individually.

The primary objective of the study was to compare the effectiveness of institutional funding for MRL's with that of project funding for materials research. Emphasis was placed on the principal results and impacts of the MRL program since its inception in 1961, with particular focus on the period after NSF assumed sponsorship in 1972. Five investigators were involved in the study full-time for about 18 months.

Background of the MRL Program

The MRL program had its origin in the Interdisciplinary Laboratory (IDL) Program established in 1960 by the Advanced Research Projects Agency (ARPA) of the Department of Defense. The ARPA action was taken in response to a concern within the government that major hardware research and development programs were being impeded by the failure of materials technology to keep pace with needs.

Forty-five universities submitted proposals to establish IDL's, and 12 were selected. The funding arrangements with these 12 universities were designed to encourage stability and long-term university commitments. One key feature allowed the universities to make capital investments for IDL buildings and to be paid back over a 10-year period by ARPA through "building use" charges. A second key feature was that initial contracts covered a 4-year period. At the end of each year, contracts were renewed for an additional year, maintaining 4-year forward funding. This "block" or institutional funding approach, allowed the laboratories thus established to allocate funds internally to research projects rather than requiring them to request funds from ARPA on a project-by-project basis.

In July 1972, the IDL program was transferred from ARPA to NSF and renamed the MRL program. The term "block funding" was also changed to "core funding," highlighting the fact that other NSF funds, in the form of project grants, were available to support individual research efforts at the institutions. By 1976, NSF had added four new MRL's, and its funding for the MRL program in fiscal year (FY) 1976 was $14.6 million.

Two other federal agencies, the Atomic Energy Commission (AEC) and NASA, also established IDL's in the 1960's. The two IDL's originally sponsored by the former are now sponsored by DOE, and NASA continues to sponsor two of the three that it originally established.

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Summary. The performance of the 20 materials research laboratories (MRL's) at universities funded with institutional grants by the National Science Foundation, Department of Energy, and National Aeronautics and Space Administration is evaluated in comparison with 15 other universities (non-MRL's) receiving individually funded projects for materials research. Performance is measured by peer review and citation frequency analysis of publications, subjective evaluation of research achievements and researcher reputation by a panel of experts, review of equipment purchases and utilization, and analysis of administrative costs. The study concludes that there are no significant differences between the MRL's and non-MRL's with respect to innovation, interdisciplinarity, utilization of specialized equipment, concentration of funding, rate of turnover, duration of research areas, and level of effort per research paper. The MRL's have a greater number of major achievements and attract researchers with higher reputations. The MRL's tend to emphasize experimental work, and in about 70 percent of the materials research areas sponsored by the National Science Foundation there is no overlap between the two groups. Institutional grants involve much less total (federal plus university) administrative cost per grant dollar than project grants.

The Performing Sector

MRL group. The MRL's included in the present study were laboratories within 16 universities, each with its own administration headed by a director. The core (institutional) grants from NSF to each of these laboratories for 1977 ranged from $200,000 to $1,950,000. The cumulative core funds from inception of the laboratories through 1977 ranged from $0.74 million to $35.8 million each (Table 1).

The distribution of MRL members by discipline shows that physics departments have been involved most heavily in MRL research, followed by materials and chemistry departments. This distribution has held since July 1972.

Since taking over the MRL program, NSF has encouraged the MRL's to concentrate their research efforts into specific areas. The MRL's generally choose the areas they wish to emphasize. However, NSF has occasionally expressed a preference.

NSF project-funded group (non-MRL's). To compare project-funded and institutionally funded research, the study team used as a control a group of universities that do not receive federal institutional funding for materials research. From FY 1970 through 1975, 164 universities that did not have MRL's or IDL's received NSF project grants for materials research. The study team selected the 15 institutions receiving the largest amount of NSF project funds over this 6-year period. Together they accounted for 40 percent of project funds granted in FY 1975 by NSF's Division of Materials Research (DMR) to individual academic researchers outside the MRL's and IDL's. The primary concentration of DMR funds at these institutions was in the physics and materials departments.

These 15 universities form a mix that reflects the heterogeneous composition of project-funded institutions in general (Table 2). Five have materials science centers, which function somewhat like the MRL's and IDL's.

Non-NSF block-funded group. The two DOE core-funded materials laboratories were included in this study. One is at the University of Illinois; the other, at Lawrence Berkeley Laboratory (LBL). Both laboratories have large, well-established materials research programs housed in central facilities and stress interdisciplinary collaboration in research. The program at LBL includes chemistry, physics, metallurgy, ceramics, and nuclear engineering; that at Illinois encompasses ceramics, metallurgy, physics, chemistry, and chemical engineering.

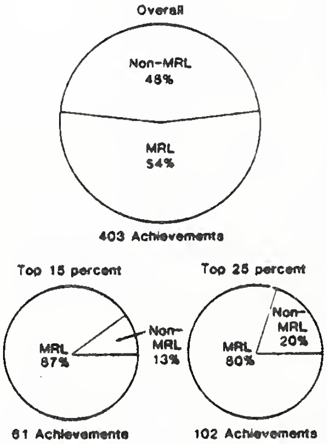

Fig. 1. Results of evaluation of major achievements (NSF-sponsored research activities only).

The two NASA institutions with core-funded materials programs were also included in this study. Both were among the universities originally selected to be IDL's. The materials research program at Rensselaer Polytechnic Institute was started in 1960; that at the University of Washington, in 1963. Both are much smaller in terms of core funds received than the MRL's supported by NSF. The objectives of the materials research programs at these universities are related to NASA's mission and differ substantially from those of the NSF-funded MRL's and the DOE-funded IDL's.

Research Capability

The capability of universities to perform research was measured in terms of researchers and equipment. To see whether the MRL's had attracted researchers with higher reputations than the non-MRL's, the study team compiled a list of 229 full professors who had joined or left seven MRL and ten non-MRL universities between 1966 and 1976. The departments of interest were those engaged to a significant extent in materials research. The professors' reputations were evaluated on the basis of two criteria: subjective judgments by a panel of 19 experts and the number of awards received for scientific research. All statistical tests were performed with a type 1 error (alpha) tolerance of .10. The results of this comparison show that the universities with MRL's attracted researchers with a higher average reputation than did the non-MRL schools with or without materials centers.

Availability of equipment was compared by analyzing equipment inventories provided by 11 MRL's and 8 non-MRL's. These inventories identified the purchase price and date of purchase of all equipment. Equipment that cost less than $3000 was excluded. The comparison showed that equipment expenditures for MRL central facilities were not significantly different from those of materials science centers at non-MRL's. It also showed that materials research equipment holdings of universities with MRL's (including equipment outside central facilities) were more extensive than those of non-MRL universities without materials science centers. The average cost per item of equipment in MRL central facilities and at the non-MRL materials science centers was also higher than at other non-MRL's.

In related analyses, the study team determined that about 70 percent of the materials research areas sponsored by NSF at the institutions surveyed showed no overlap between MRL's and project-funded institutions. Also, it was found that there were no statistically significant differences between MRL's and non-MRL's in concentration of funding, annual rate of turnover in research areas, duration of research areas, and continuity of staffing.

Comparison of Publications

A major effort was devoted to analysis of research publications, since these represent the primary research product of the universities. The study team obtained, from a selected set of 215 materials science experts, detailed reviews of 690 papers that had appeared primarily in refereed journals, and citation counts for 2299. Also, a separate citation frequency analysis was made for each paper.

The 690 papers included papers from the DOE and NASA IDL's, as well as MRL and non-MRL papers. They were chosen randomly with a proportional stratified sampling scheme. Publications were grouped into strata by total project support and by characteristics of the researcher's institution. Thus, 157 papers resulting from core funding under ARPA sponsorship in 1972 were compared against 244 papers resulting from NSF core funding in FY 1974 and FY 1975. This comparison was made to see whether research results were significantly different between the periods of ARPA and NSF sponsorship. The NSF core-funded papers were compared with 158 project-funded research papers from non-MRL's, 63 project-funded papers from the MRL's, and 50 DOE and 18 NASA core-funded papers. With these sample sizes, the probability of rejecting a true hypothesis (type 1 error) was set at .10.

The NSF's objectives set the criteria against which certain characteristics of research were measured. The major characteristics evaluated were the quality of performance (as measured by technical depth and accuracy), the degree of innovation, the impact on scientific progress, and the level of interdisciplinary collaboration. Results of the review showed that:

1) The NSF/MRL core-funded papers reflected a greater emphasis on experimental work than the papers from non-MRL's without materials science centers. This difference in orientation of research was the most clear-cut result of all the publications comparisons.

2) Although all the papers were predominantly oriented toward science, the proportion of NSF/MRL core-funded papers that were engineering-oriented was significantly higher than those from non-MRL's without materials science centers.

3) There were no significant differences among any of the populations compared with respect to overall indicators of innovation or measures of interdisciplinarity.

4) While differences were found in other attributes, such as quality of procedures, equipment use, and contribution to scientific progress, the review of the publications did not lead to a clear-cut acceptance or rejection of the hypothesis that MRL's produce better research (in terms of meeting NSF's criteria) than non-MRL's.

This last finding is not surprising, considering that almost all the papers had appeared in refereed journals. Also, each paper typically represented a small part of a total research effort, and the importance of the entire effort could not always be seen. Finally, all the institutions considered in the study were nationally prestigious, and averaging the characteristics of each group's output probably obscured any individual differences.

The comparison of citation frequency is valid as a measure of relative merit only if the data are reliable and if the citations are for merit rather than some other reason. The problem of nonmatching between a valid journal reference and the citation source encountered in this study could cause difficulty when dealing with a single article, but probably did not affect conclusions about populations. The

Table 1. Classification of MRL's by amount of NSF core funding.

MRL funding class	University	Core funds for FY 1977 ($ thousand)	Core funds from inception through FY 1977 ($ million)	Date of inception
Recently created	Penn State	275	0.79	15 May 1974
	Case Western	300	0.74	1 Sept. 1974
	Massachusetts	400	1.21	15 June 1973
	Carnegie-Mellon	400	1.23	15 June 1973
Small	Maryland	200	7.17	3 Oct. 1961
	North Carolina	300	7.93	2 Oct. 1961
Midrange	Harvard	575	10.2	20 June 1961
	Chicago	630	11.6	20 June 1961
	Purdue	850	11.5	5 Oct. 1961
Large	Stanford	1,200	17.6	20 June 1961
	Brown	1,200	19.5	20 June 1961
	Northwestern	1,250	21.0	20 June 1960
Very large	MIT	1,865	26.5	20 June 1961
	Pennsylvania	1,950	30.1	22 June 1960
	Cornell	1,950	35.8	20 June 1960
MRL's with multiple core support (NSF and DOE)	Illinois	1,270 NSF	23.2 ARPA/NSF	1 June 1962

Table 2. Materials research characteristics of the non-MRL's.

University	Materials department or program	Materials science center or institute	Interdisciplinary institutes*
Utah	Yes		
Florida	Yes	Yes	Yes
Lehigh	Yes	Yes	Yes
California (Los Angeles)	Yes		
Rutgers			
California (San Diego)			Yes
Ohio State			
Pittsburgh	Yes		
Wisconsin (Madison)	Yes	Yes	
California (Santa Barbara)			Yes
Connecticut		Yes	Yes
Michigan	Yes		Yes
Oregon (Eugene)			Yes
Yale			
Washington (St. Louis)	Yes	Yes	

*Not exclusive to materials research.

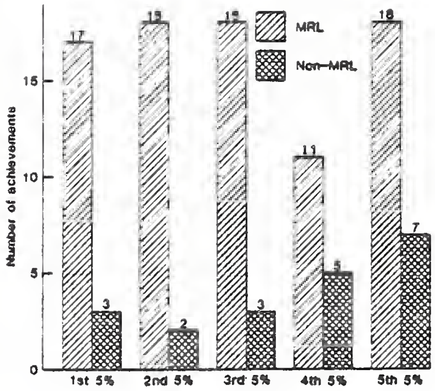

Fig. 2. Distribution of achievements in top 25 percent by ~ 5 percent increments (NSF-sponsored research activities only).

cross-checking of highly cited papers against peer reviews (when possible) showed that the citations were correlated with favorable comments by reviewers. The conclusions from the citation analysis were that (i) NSF project-funded papers at MRL's were cited more frequently than NSF/MRL core-funded papers; (ii) core-funded papers at MRL's under both ARPA and NSF sponsorship were cited with about the same frequency as papers from DOE/IDL's and NSF/non-MRL's without materials science centers; (iii) papers from NSF/non-MRL's with materials science centers were cited less frequently than MRL core-funded papers; and (iv) papers from NASA/IDL's were cited least frequently.

Productivity

The relative productivity of core-funded (MRL) and project-funded (non-MRL) institutions was examined by analyzing the research achievements and the level of effort associated with research publications. Research achievements were evaluated by compiling a list of 401 achievements that had been submitted by the universities and identified by them as being fully developed. This list was then evaluated by the same panel of 19 experts who rated the reputations of researchers.

On the basis of research projects in FY 1974 and FY 1975 that produced publications, it appears that the funding level of average MRL core-funded projects was $32,500, compared to $46,000 at non-MRL's. Thus the MRL's seem to have had about 30 percent more projects per unit of funding. However, the average level of research effort per publication was about the same for MRL's ($14,000) and non-MRL's ($15,000). At the non-MRL's, the average funding per project was $39,000 at universities with materials science centers and $50,700 a

Table 3. Summary of administrative costs.

Activity	Comparison		
	MRL core		Non-MRL
Principal investigator discusses research plans with MRL director or NSF program administrator	60 to 90 percent success rate		30 to 70 percent success rate
Principal investigator prepares proposal to MRL or NSF	2 to 20 man-hours		2 weeks to 2 months
MRL director and executive committee review	60 to 100 man-hours 0.07 to 0.11 hour per $1000		0
MRL director prepares the MRL proposal using the content of individual and emphasis area proposals	80 to 180 man-hours 0.09 to 0.02 hour per $1000		0
University offices review the proposals		~ 1:19*	
NSF reviews proposals and decides on finding		~ 1:2*	
NSF prepares notice of award or denial		~ 1:19*	
Grant account is set up by university accounting		~ 1:19*	
Grants without renewal funding are closed out by university administration		~ 1:19*	
Activities associated with normal grant expenditures require additional time of university personnel		~ 1:10*	
Expenditures requiring rearrangement of budget categories require university and NSF personnel		~ 1:19*	
Members of emphasized areas meet to discuss research progress	25 to 100 man-hours 0.03 to 0.12 hours per $1000		0
MRL directors meet twice each year	27 man-hours 0.03 hours per $1000		0
NSF program administrators conduct formal or informal site visits once each year	Informal 180 to 240 man-hours 0.20 to 0.26 hour per $1000		0†
	Formal (every third year) (420 to 480 man-hours)/3 (0.46 to 0.53 hour per $1000)/3		0†
Annual technical reports are prepared by principal investigators or MRL director	60 to 100 man-hours 0.07 to 0.11 hour per $1000		4 to 16 hours 0.00 to 0.34 hour per $1000
Annual fiscal reports are prepared by university accounting office		~ 1:19*	
Total for activities	1.0 to 1.7 man-hours per $1000		1.8 to 7.1 man-hours per $1000

*Relative magnitudes of effort per unit of funding. †Program administrators for project grants do conduct site visits but only in conjunction with other business travel. Travel funds for NSF staff are about the same per grant dollar for administering core grants or project grants.

those without such centers. The comparable levels of effort per publication were $14,300 and $15,400, respectively.

The MRL's had much more than a proportional share of achievements rated in the top 15 percent, based on total NSF funding from FY 1973 through FY 1976. However, the MRL's had slightly less than a proportional share of achievements rated in the top 25 percent. The MRL achievements rated in the top 25 percent reflect a greater emphasis on experimental work than those of non-MRL's. The results of this evaluation are shown in Figs. 1 and 2.

Administrative Costs

The cost for the administration of grants includes the time and resources of both the university and the sponsor. The actual time involved may not necessarily be reflected in the costs charged for administration. Therefore, both the dollar costs for administration and the actual time involved in administrative activities were examined, with greater emphasis on the latter, since it represents true costs.

A summary of administrative costs is presented in Table 3. Where similar activities are involved, the table shows that these activities cost less per grant dollar for MRL core grants. This is due in large part to the decentralization of management to the university personnel, who have more detailed knowledge of the activities being managed.

Due to nonhomogeneous units of measure, the overall cost of administration cannot be determined for the two types of grants. Nevertheless, for all activities estimated in man-hours (Table 3), the total cost per thousand grant dollars for MRL administration is between 1.0 and 1.7 hours, compared with a range of 1.8 to 7.1 hours for non-MRL administration. If the cost per man-hour is assumed to be $20, then MRL costs range from $20 to $34 per thousand grant dollars while non-MRL costs range from $36 to $142 per thousand. The major source of this difference is the time required for preparation of project grant proposals (whether of an experimental or theoretical nature), which amounts to more time per dollar than that for all MRL administrative activities. Unfortunately, this time difference can be equated almost exactly with lost research effort at the non-MRL's. Furthermore, for all other activities where costs were estimated only proportionately, the MRL administration is from 2 to 19 times less costly. Therefore, in terms of time and costs involved in administering grants, the MRL core, or institutional, grant mechanism is much more efficient than the project grant mode.

Conclusions

Research at the institutionally funded MRL's is not more integrated when measured in terms of the concentration and duration of support of research areas. On the basis of the publication reviews, there is no significant difference between MRL's and others on interdisciplinarity or utilization of essential specialized equipment. However, the MRL's are different as the sole contributors to certain research areas and in their emphasis on experimental work. There is little difference in terms of level of effort per research paper between MRL's and non-MRL's. The MRL's appear to be more productive than non-MRL's in terms of major achievements, and are more successful than non-MRL's in attracting researchers with reputations measured as high in terms of scientific honors and esteem among peers. Institutional grants, in the form of core grants to MRL's, involve much less total (federal and university) administrative cost per grant dollar than project grants. In terms of program oversight, the MRL program administration at NSF stresses evaluation of accomplishments, whereas the project grant emphasis is on proposal evaluation.

Setting aside qualitative differences between universities, it appears from this study that institutional grants result in different types of work (for example, more experimental) in MRL's compared with that in non-MRL's. The institutional grants are aimed, in part, at providing extensive experimental facilities. These facilities are apparently put to good use. It is possible that the facilities are also influential in attracting top-quality researchers. The variable costs of administering grants are small in comparison to fixed costs. Thus the institutional grants, which on average are 19 times higher than the project grants, result in much lower costs per unit of funding. Finally, the institutional grant mechanism provides more systematic feedback on research accomplishments (*1*).

References and Notes

1. There have been five formal evaluations of the IDL MRL program. The first was an internal review performed by ARPA, "Report on the IDL's," submitted to the director of ARPA on 30 August 1966. The others were as follows: M. J. Sinnot, O. C. Trulson, H. H. Test, "The ARPA interdisciplinary laboratory program" (Institute for Defense Analyses, Arlington, Va., 1 February 1971); "Materials research laboratories: summary evaluation" (Paper 27-54, National Science Foundation, Washington, D.C., 2 March 1972); Management and Cost Analysis Staff, "Materials research laboratories study" (National Science Foundation Grants and Contracts Office, Washington, D.C., January 1974); Committee on the Survey of Materials Science and Engineering, "Summary report and supplementary report of materials and man's needs" (National Academy of Sciences–National Research Council, Washington, D.C., 1974), vol. 3. In the latter report (the so-called COSMAT report), the following observations were made: (i) There is little or no correlation between magnitude of block funding and development of an institution as a "materials school." (ii) There is only a modest correlation between the availability of block funding and the existence of specialized laboratory buildings, central facilities, or facilities on their scale. (iii) There is a negative correlation between the availability of block funding and interaction with industry. (iv) There is no correlation between large block grants and degree of interdisciplinary interaction. (v) Excellence was achieved at many of the block-funded centers in the very same areas, while other important areas were neglected. However, the COSMAT report recommended that support of materials research centers through block grants be accepted as an established funding method; that block grants be awarded and renewed on a competitive basis and provide for forward or step funding; that, in addition to support for individual scientists, some effort be made to take advantage of local research specializations; and that appropriate parts of the center programs be oriented toward materials systems (integrated combinations of materials), processing, and applications.
2. We thank M. T. Lethi, B. B. Stokes, J. Verhoeff, R. S. Greeley, J. B. Wachtman, Jr., and W. R. Prindle for their contributions and assistance. We also thank H. J. Piccariello and W. D. Commins for their contributions to the statistical analysis and for their review and oversight of the entire study. This article is based on a report by J. G. Ling, M. A. DeBoll, M. T. Lethi, B. B. Stokes, and J. Verhoeff ["Evaluative study of the materials research laboratory program [Technical Report 7764, Mitre Corp., Bedford, Mass., September 1978] under NSF contract OAO 7624069.

MEMORANDUM

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH

TO : Dr. Joseph G. Perpich, Associate Director
for Program Planning and Evaluation

DATE: September 30, 1980

Richard J. Powers

FROM : Richard J. Powers, Chief, Financial Advisory Services Branch, DCG

SUBJECT: DHHS Policies and Procedures for Establishing Indirect Cost Rates and Reimbursing Indirect Costs

As requested, attached is a copy of informative language extracted from a DHHS brochure (OASC-1) published as an aid to colleges and universities in understanding the process of determining and reimbursing indirect costs under the Department's grant and contract programs. This particular excerpt (Section I of the Brochure) provides general information on the nature of indirect costs and indirect cost rates, and describes the process of establishing the rates and reimbursing indirect costs.

SECTION I
INDIRECT COSTS
GENERAL POLICIES AND PROCEDURES

NATURE OF INDIRECT COSTS

Indirect costs are costs that are incurred for common or joint objectives, and therefore cannot be readily and specifically identified with a particular project, an instructional activity or any other institutional activity. The costs of operating and maintaining facilities, equipment, and grounds; depreciation or use allowances; general and departmental administration; and library expenses are typical examples of the types of costs which are usually considered as indirect costs at colleges and universities.

In theory, all of these costs might be charged directly. This approach, however, is usually impractical. They are therefore grouped into a common pool(s) and distributed to benefiting activities by a cost allocation process. The end product of this allocation process is an indirect cost rate(s) which is applied to individual projects supported by grants, contracts and cooperative agreements with the Federal Government(collectively referred to as "sponsored agreements") to determine the amount of indirect costs applicable to each project.

Indirect costs are reimbursed based on an institution's established indirect cost rate(s), subject to statutory or administrative limitations, as part of the total costs of individual sponsored agreements.

INDIRECT COST RATES

The indirect cost rate is a ratio, expressed as a percentage, of the indirect costs to a direct cost "base". The direct cost base is usually either modified total direct costs or direct salaries and wages, depending on the method used by the institution to compute its indirect cost rates. A discussion of the methods used to compute indirect cost rates, including a description of the specific cost elements making up the modified total direct cost base, is included in Section II.

Indirect cost rates are established by negotiation between the institution and a "cognizant" Federal agency which acts on behalf of all Federal agencies in negotiating rates with the institution. The types of rates that may be established through these negotiations are described below.

Provisional Rate

A provisional indirect cost rate is a temporary rate established for a given period ~~to~~ of time to permit funding and reporting of indirect costs pending establishment of a final rate (or other permanent rate) for that period. When a permanent rate is established, the indirect costs claimed by using the provisional rate are adjusted to reflect the indirect costs based on the permanent rate.

Final Rate

A final indirect cost rate is a permanent rate established after the institution's actual costs for a specific period (usually its fiscal year) are known and the amount of allowable indirect costs applicable to sponsored projects have been determined. This type of rate is not subject to adjustment. Final rates are used to adjust indirect costs initially claimed based on provisional rates in grant expenditure reports and contract public vouchers.

Predetermined Rate

A predetermined indirect cost rate is a permanent rate established for a specific future period (usually one fiscal year) based on an estimate of the costs for that period. Except under very unusual circumstances, this type of rate is not subject to adjustment. Predetermined rates are established when there is reasonable assurance, based on experience and a reliable estimate of the institution's costs, that the predetermined rate will approximate the institution's actual rate.

Fixed Rate With Carry-Forward Provision

A fixed rate with carry-forward provision is a permanent rate that has the same characteristics as a predetermined rate. However, unlike a predetermined rate, the difference between the estimated costs used to establish the fixed rate and the actual costs of the fiscal year covered by the rate is "carried forward" as an adjustment to the rate computation of a future year(s). The fixed rate should be based on accurate estimates for the year involved so as to avoid unduly large carry-forward adjustments.

The carry-forward adjustment cannot be made for the fiscal year immediately following the year covered by the fixed rate because the fixed rate for the following year will have been established before the amount of the carry-forward adjustment is known. The adjustment will therefore be made in the second or third year. The carry-forward procedure is discussed in greater detail and illustrated in Appendix G.

Selection of Type of Rate

Institutions are encouraged to use either predetermined rates or fixed rates with carry-forward provisions. These rates permit a more timely closing of completed sponsored agreements and generally eliminate the necessity of making retroactive adjustments on individual sponsored agreements as would be the case when provisional and final rates are used.

SUBMISSION OF INDIRECT COST PROPOSALS

General Requirement

An institution must have a current approved indirect cost rate before a claim for indirect costs will be recognized by awarding agencies. An indirect cost proposal documents how the institution develops its indirect cost rate(s) and is the basis for the cognizant agency's approval of the rate(s). All claims for indirect costs must be supported by the timely submission of a proposal for each fiscal year in which indirect costs are claimed. Institutions that do not submit timely indirect cost proposals risk losing their claims for indirect cost as described in the subsection entitled "Award and Settlement of Indirect Costs".

Guidelines on the preparation of indirect cost proposals are provided in Section II.

Where To Submit Proposals

Under Office of Management and Budget Circular A-88, each college and university is assigned to a single Federal agency which acts on behalf of all Federal agencies in negotiating indirect cost rates and other rates with the institution. The agency assigned this responsibility is referred to as the "cognizant agency". Except under unusual circustances (and then only in coordination with the cognizant agency), the rates negotiated by the cognizant agency must be accepted by the other Federal agencies.

Circular A-88 also designates cognizant agencies for the purpose of auditing and resolving audit findings at an institution (except where an audit finding relates only to sponsored agreements awarded by an agency other than the cognizant agency). The same agency is usually designated as the cognizant agency for all three functions (rate negotiation, audit, and audit resolution).

The Department of Health and Human Services (HHS) has been assigned cognizance for most institutions. Circular A-88, along with a listing of institutions which are not assigned to HHS, is shown in Appendix A.

If negotiation cognizance for an institution is assigned to HHS, the institution's indirect cost proposals must be submitted to the Department's Regional Division of Cost Allocation (DCA) responsible for the geographical area in which the institution is located. The address and area covered by each DCA is shown in Appendix B.

If an institution is assigned to a Federal agency other than HHS, its indirect cost proposals should be submitted to that agency in accordance with the instructions of the agency. It is not necessary to submit a copy of the proposal to the DCA, unless it is specifically requested.

Occasionally, cognizance for an institution may be transferred from one Federal agency to another. When this occurs, the institution will be notified by the "new" cognizant agency.

Due Dates and Coverage of Proposals

The due dates for submission of indirect cost proposals to the DCA (when HHS is the cognizant agency) depend on whether an institution has previously established an indirect cost rate with the Government.

No Previous Rate

If an institution has not previously established an indirect cost rate with the Government, it must submit its initial indirect cost proposal to the DCA immediately after it is notified that a sponsored agreement providing indirect cost reimbursement will be awarded. If possible, the proposal should be submitted before the sponsored agreement is awarded, but not later than three months after the effective date of the sponsored agreement. In the case of contracts, the proposal must be submitted and a rate established before the contract is awarded.

The proposal will be used to establish a rate to permit funding of indirect costs under the sponsored agreement. It should normally be based on the institution's actual costs for its most recently completed fiscal year. However, if the institution anticipates a change in its operations that would significantly increase or decrease the rate for the fiscal year(s) in which the sponsored agreement will be performed, the proposal must be based on projected costs for that year(s).

When the proposal is submitted, it will be processed on a priority basis by the DCA. If the institution needs technical assistance in preparing the proposal, it should request this assistance from the DCA.

Previously Established Rates

Institutions that have previously established indirect cost rates with the Government must submit a new indirect cost proposal to the DCA within six months after the close of each fiscal year. The type of rate(s) included in the proposal and the fiscal year(s) on which the rate should be based will be governed by the specific circumstances involved:

a. If a provisional rate(s) was previously established for the most recently completed fiscal year, the proposal must include (1)a final rate(s) for the completed year based on actual costs for that year, and (2) fixed, predetermined or provisional rates for the next two years. If the rates are expected to remain relatively stable, the rates for the following years should also be based on actual costs for the most recently completed year. However, if the institution anticipates a change in its operations that would significantly increase or decrease the rate for one or both of these years, the rate(s) must be based on projected costs.

b. If a fixed or predetermined rate(s) was previously established, the proposal must include a fixed, predetermined or provisional rate(s) for the fiscal year immediately following the year covered by the last negotiation. The rate(s) should be based on actual costs of the most recently completed year, or if the institution anticipates a significant change in its operations, projected costs for the year covered by the rate(s).

Extention of Due Dates

Occasionally, extenuating circumstances may justify an extention of the due date for submission of a proposal. When a due date cannot be met, a formal request for an extension, stating the reasons, must be sent to the DCA prior to the due date. If the request is approved and the proposal is submitted in accordance with the conditions of approval, no penalty will be assessed.

Supporting Documentation

Each indirect cost proposal must be accompanied by, and be cross-referenced and reconciled to, the institution's independently audited financial statements for the fiscal year on which the proposal is based. If independently audited statements are not available, the institution should contact the DCA to determine what other financial documents will be acceptable to substantiate the amounts in the proposal. If a rate in the proposal is based on projected costs for a future year, the rate computation must be cross-referenced and reconciled to the institution's budget for that year. In these cases, the future year's budget and the financial statements for the most recently completed fiscal year must be submitted with the proposal.

The proposal must also be accompanied by the fringe benefit information described in Section III, and where applicable, the information on off-campus rates and composite rates [redacted] described in the subsection on "Special Indirect Cost Rates" in Section II.

NEGOTIATION OF RATES

The DCA will negotiate an indirect cost rate(s) with the institution based on an evaluation of the institution's indirect cost proposal. In some cases, the DCA may request an audit of the proposal before the rates are negotiated.

The results of each negotiation will be formalized by a Negotiation Agreement signed by the DCA and an authorized representative of the institution. Each agreement will include:

- The agreed upon rate(s) and information directly related to use of the rate(s) (e.g., type of rate, effective period, direct cost base, etc.);

- The treatment of fringe benefits as either direct or indirect costs;
- General terms and conditions of the Agreement;
- Special terms and conditions of the Agreement (if any); and
- Additional information (if necessary) that may be needed by the users of the Agreement.

The Negotiation Agreements are reproduced and distributed to personnel within HHS and other Federal agencies responsibile for the award and settlement of sponsored agreements. The Negotiation Agreement form currently in use is shown in Appendix H.

If the institution is assigned to a cognizant agency other than HHS, that agency will send a copy of its Negotiation Agreement with the institution to the DCA, and the rates will be recognized by HHS. HHS will also distribute copies of the Agreement to all concerned Federal agencies.

DISPUTES

On rare occasions, the DCA and an institution may not be able to reach agreement on an acceptable indirect cost rate (or other rate described in Section III) for use on sponsored agreements.

When this occurs, the DCA will make a unilateral determination of the rate(s) considered acceptable by the Department and will notify the institution of the determination. The DCA will also advise the institution of its right to appeal the determination and the appeal procedures to follow.

The institution may appeal the determination under either the Department's Grant Appeals Regulations (45 CFR, Parts 75 and 16) or the "disputes" provisions of affected contracts. However, if the institution elects to appeal the issues under the contract appeal procedures, it may not subsequently appeal the same issues to the Department's Grant Appeals Board under 45 CFR Part 16.

AWARD AND SETTLEMENT OF INDIRECT COSTS

Applying Indirect Cost Rates

The amount of indirect costs applicable to each sponsored project is determined by multiplying the appropriate indirect cost rate(s) by the direct base costs of the project.

In applying indirect cost rates to individual projects, the rate covering the period in which the direct base costs are actually incurred must be applied to those costs. If the budget period of a sponsored agreement does not coincide with an institution's fiscal year, at least two indirect cost rates must be used. For example, assume that rates of 35% for the fiscal year ending June 30, 1981 and 30% for the fiscal year ending June 30, 1982 have been established; and that the 12 month budget period of a sponsored agreement begins on January 1, 1981. The indirect costs would be computed as follows:

	Fiscal Year Ending		Total
	6/30/81	6/30/82	
Direct Cost Base	$30,000	$20,000	$50,000
Rate	x 35%	x 30%	
Indirect Costs	$10,500	6,000	$16,500

A single rate may be used for purposes of awarding indirect costs when the budget period of a sponsored agreement does not coincide with the institution's fiscal year if the amount based on a single rate reasonably approximates the amount that would have been awarded had two rates been used. In these cases, the rate covering the earlier fiscal year will normally be used. Final settlement, however, will be computed by using the rates established for the two (or more) fiscal years in which the direct base costs are incurred.

Award of Indirect Costs

Subject to any statutory or administrative limitations, indirect costs will be awarded using the latest established indirect cost rate applicable to the budget period of the sponsored agreement. Institutions seeking indirect cost reimbursement should show the requested amount and the appropriate rate and base in their grant applications and contract proposals. The applications and proposals should also indicate whether the project will be conducted on-campus or off-campus, and, if the project will be conducted partially off-campus, the portion that will be conducted off-campus.

Grant applications and contract proposals are frequently submitted far in advance of the date of an award. As a result, the indirect cost rate shown in the application or proposal may be outdated when the award is made. In these cases, the HHS awarding agency will use the more current rate to fund indirect costs in the award.

When indirect costs are awarded on the basis of a provisional rate, adjustments to the amount awarded will not usually be made during the sponsored agreement's budget period. However, if there is a major change in the provisional rate during the budget period, and this change results in a significant under or over-funding of indirect costs, the sponsored agreement may be amended to increase or decrease the amount awarded. This determination will take into account the financial position of the institution as well as the administrative effort involved in amending the sponsored agreements. Generally, these amendments will not be made unless the total impact on all HHS sponsored agreements is at least $100,000 or 20% of the total costs of the agreements.

Settlement of Indirect Costs

Grant expenditure reports and contract public vouchers (collectively referred to as "financial reports") must reflect the appropriate amount of indirect costs based on the most current rate(s) applicable to the period involved. If a provisional rate is used, the amount claimed must be adjusted when a final rate applicable to the period is established. These adjustments must be initiated by the institution.

Generally, adjustments are required only when a provisional rate is used to initially claim indirect rates on financial reports and the provisional rate is later replaced by a final rate. However, occasionally, a provisional rate may be replaced by a fixed or predetermined rate. This would occur when a fixed or predetermined rate applicable to a given fiscal year is established sometime after the beginning of the year and replaces a provisional rate previously in effect for the earlier part of the year. In these cases, if the provisional rate was used to claim indirect costs for the portion of the year before the fixed or predetermined rate was established, the amount claimed must be adjusted to reflect the amount based on the fixed or predetermined rate.

Adjustments to indirect costs claimed on HHS grants must be made by submitting a "Summary Report of Expenditures Adjustment Sheet" showing the adjustment to each grant. (Submission of a revised expenditure report for each grant is not required.) The adjustment sheet must be submitted within one year after the Negotiation Agreement establishing the final, fixed, or predetermined rate(s) is executed. Upward adjustments will not be considered if the adjustment sheet is not submitted within the one year period. If adjustments are required for grants awarded by more than one HHS awarding agency (e.g. the National Institutes of Health, the Office of Human Development Services, etc.), a separate adjustment sheet is required for each agency. A suggested adjustment sheet format, along with instructions on its preparation, is shown in Appendix I. All adjustment sheets, regardless of the HHS awarding agency(ies) involved, should be sent to the:

Indirect Cost Management Section
Office of Financial Management
National Institutes of Health
Building 31, Room B1B07
Bethesda, Maryland 20014

If upward adjustments result in the need for funds in excess of the total amount awarded for a grant budget period, the additional funds will be provided to the institution if they are available from the same Federal appropriation used to fund the grant budget period.

Adjustments to indirect costs claimed on HHS contracts must be made in accordance with the Department's procurement regulations.

Institutions Without Currently Effective Indirect Cost Rates

Failure to Submit Timely Proposals

If an institution does not submit a timely indirect cost proposal, it will be considered as not having a currently effective indirect cost rate. In the absence of this rate, future awards made by the Department will not provide funds for indirect costs. If the institution subsequently establishes a rate, the awarding agency may amend the award to provide an appropriate amount for indirect costs, if the amendment can be made within the same Federal Fiscal Year in which the award was made. This amount, however, will be limited to the indirect costs applicable to the period beginning on the first day of the month in which the proposal was submitted.

When an award is made without funds for indirect costs, these costs will not be allowed on the financial report(s) submitted under the award.

If the award was amended to provide funds for indirect costs, the indirect costs allowed on the financial report (and the Summary Report of Expenditures Adjustment Sheet, if required) will be computed on the same basis as was used to compute the amount provided in the amended award. For example, if funds for 75% of the indirect costs were provided to the institution in the amended award, only 75% of the indirect costs will be allowed on the financial report and Summary Report of Expenditures Adjustment Sheet.

Failure to submit a timely indirect cost proposal may also result in the disallowance of indirect costs previously reimbursed on the basis of a provisional indirect cost rate. These disallowances will be made if the institution does not submit a timely indirect cost proposal to establish a permanent rate (final, fixed, or predetermined) for the period involved, and after being notified that a proposal must be submitted to substantiate the claim, still does not submit the proposal.

No Previous Indirect Cost Rates with Government

In some cases, a currently effective indirect cost rate may not be available at the time a grant is awarded because the institution has never established a rate with the Government and is unable to establish its initial rate prior to the date of the award. In these cases, a provisional amount equal to one-half of the indirect costs requested by the institution, up to 10% of direct salaries and wages will be included in the grant.

If the institution later submits a timely indirect cost proposal, the grant may be amended to provide additional funds representing the difference between the amount initially awarded and the amount based on the approved rate. However, because of legal constraints, amendments to grants for this purpose must be made within the same Federal Fiscal year in which the initial award covering the grant budget period was made. If it is not possible to amend the grant to provide the additional funds, the funds will be provided to the institution (if available) during the indirect cost settlement process described earlier in this Section. If the institution does not establish an indirect cost rate prior to the submission of the grant expenditure report, its claims for indirect cost reimbursement will not be allowed.

As indicated in the subsection entitled "Submission of Indirect Cost Proposals", if an institution wishes to be reimbursed for indirect costs under a contract, its indirect cost proposal must be submitted and a rate established before the contract is awarded.

LIMITATIONS ON INDIRECT COST REIMBURSEMENT

In most cases, sponsored agreements provide full reimbursement of indirect costs. However, a few HHS programs have legislative or administrative limitations on the reimbursement of these costs. Indirect costs applicable to sponsored agreements awarded under these programs are reimbursed in accordance with the legal or administrative limitations.

Indirect costs are not reimbursed on construction grants, grants to individuals, or grants to institutions located outside the territorial limits of the United States. Indirect costs are also not reimbursed on scholarships, fellowships, and similar awards where Federal financing is exclusively in the form of fixed amounts or the published tuition rates and fees of an institution.

Indirect cost reimbursement on HHS training grants (but not training contracts) is limited to the lesser of the institution's actual indirect costs or 8% of total direct costs. The specific direct cost base used in applying the 8% rate is prescribed in policies established by the Department's awarding agencies. A training grant is defined as a grant which provides Federal financing on a cost reimbursement basis for the cost of training or other educational services. Examples of the activities covered by training grants include training programs for selected participants (including research training), summer institutes, and the development and introduction of new or expanded courses.

The submission of an indirect cost proposal to support the 8% reimbursement rate on training grants is not normally required. However, the institution is required to have documentation available for audit which shows that its actual rate is at least 8%. If the institution has an established indirect cost rate with the Government which is applicable to training grants and the rate is based on modified total direct costs, this rate will meet the documentation required. If a rate applicable to training grants based on modified total direct costs has not been established, the institution must compute an approximate rate, and retain the computation for audit. If this computation indicated that the rate is less than 8%, a formal indirect cost proposal must be submitted to the DCA.

If a provision of a training grant includes a cost sharing or matching requirement, actual indirect costs in excess of the 8% reimbursement limitation may be used to meet the cost sharing or matching requirement.

NEGOTIATION OF INDIRECT COST RATES WITH SUBGRANTEES AND SUBCONTRACTORS

As a general rule, prime contractors and grantees are responsible for negotiating indirect cost rates, where necessary, with subgrantees and subcontractors under sponsored agreements. These negotiations must be based on the Federal cost principles applicable to the organization receiving the subgrant or subcontract (collectively referred to as "subawards"). The procedures followed in conducting the negotiation are subject to review by the Department. If the prime contractor or grantee needs assistance in conducting the negotiation, it should request such assistance from the DCA.

Prime contractors and grantees are not required to negotiate indirect cost rates for subawards if any of the following conditions exist:

- The subaward does not provide reimbursement for indirect costs.
- The subaward is awarded to an organization which negotiates indirect cost rates or research patient care rates directly with the Government. In these situations, the rates negotiated by the Government will apply to all Federally-supported activities,

including those conducted under subawards.

- The subaward is a subgrant for training purposes and is awarded to a college or university, hospital, or other non-profit organizations (other than a State, local, or Indian tribal government). In these cases, the training subgrant is subject to the same rules as those applicable to training grants described in the subsection titled "Limitations on Indirect Cost Reimbursement".

DESCRIPTION OF UW-MADISON EFFORTS AT COMPLIANCE WITH FEDERAL COST PRINCIPLES[1]

The purpose of this paper is to describe the actions which have been taken at the University of Wisconsin-Madison over the past seven years to comply with Federal Cost Principles, first FM 73-8 and subsequently A-21, and to indicate the role which faculty and academic staff have played both in the development of policy and in the implementation of the required procedures.

Structure of the Institution

In order to understand some of the actions taken, it is helpful to recognize the position of UW-Madison in the University of Wisconsin System. The University of Wisconsin System consists of 2 doctoral-granting institutions, 11 other 4-year campuses, and 14 2-year centers, as well as traditional Extension activities. Indirect cost rates are negotiated on behalf of the System; however, since the dominant amount of extramural grants and contracts involves UW-Madison, the administration and faculty at Madison play a lead role in the determination of policy regarding methods of compliance with Federal Cost Principles. It is important to realize that some of the procedures described below have been developed by UW-Madison administration and/or faculty, some by System personnel, but more commonly by agreement among these groups.

The precise nature of the decision-making process at UW-Madison also requires description. As at many major institutions, authority is shared between the administration, viz. chancellor, vice chancellors and deans, and the faculty. Thus, for example, some committees are appointed by the elected University Committee, acting as the executive committee of the Faculty Senate, with the advice of the chancellor. Others are appointed by the chancellor with the advice of the University Committee. Faculty leadership in governance of the institution rests upon three basic elements. The first is the formal sharing of appointive power described above. The second is a tradition of departmental autonomy, the practice of reserving authority to departments wherever it is feasible to do so. The third is the practice of relying extensively upon part-time administrators; many of the associate deans of the various colleges and schools have dual roles as faculty and administrators. Even deans, vice chancellors and the chancellor retain close ties with their academic departments, and in some cases maintain active research programs therein.

An additional and important element is the way in which indirect cost reimbursement is budgeted at the University. Each biennium, the legislature approves a "state-supported" budget level for the University. This budget level is intended to support various activities, programs, and responsibilities of the University, including the indirect costs of the extramurally-supported programs. This total budget level is supported from a variety of sources including state tax appropriations, tuition and fee income, indirect cost reimbursement income, and other miscellaneous revenues which the University is responsible for generating in support of its established total budget level.

Should the revenue fail to materialize at the budgeted level, the University is expected to reduce its budgeted expenditure level accordingly. When this occurs, the University first looks to that portion of the budget which is intended for equipment replacement as a source for reducing its intended expenditure level. A very serious shortfall in indirect cost revenue (or any of the other revenue categories which the University is responsible for generating) would require consideration of reductions in the planned expenditure levels for supplies and staff. Should indirect cost income exceed the budgeted level for a fiscal year, only a negligible amount may be carried over to the next year.

These circumstances are not unique to UW-Madison. Nevertheless, they do affect the way in which the institution, of necessity, must respond to various changes in the parameters governing research.

Pre-A-21 Indirect Cost Discussions

Shortly after World War II, federal expenditures for research at universities increased dramatically. It soon became apparent that in addition to the direct costs of this research, other costs accrued to the insitutions for administrative and support staff, operation and maintenance of physical plant, libraries, etc. It was also clear that few universities were in a position to finance these additional expenditures themselves. These costs are in general not susceptible to unique identification with a particular research project. Therefore, provision was made for recovery of the indirect costs through an overhead charge. At UW-Madison these charges were initially rather small, and varied from project to project depending upon individual negotiations with the funding agency. As costs grew, it was obvious that there should be a single insitution-wide rate. During the period of rapid expansion of university research, when funds were relatively easy to secure, this rate occasioned comparatively little interest among faculty.

The requirement for indirect cost money increased at a substantial rate in the early 70's as the amount and complexity of research increased, as additional Federal restrictions and reporting requirements were imposed, and as inflation took its toll. The average principal investigator experienced an increase in indirect cost charges to grants and contracts accompanied by a decrease in available direct cost money for research as Federal appropriations failed to keep pace. This awakened in some, and enlarged in other faculty members an interest in the overall magnitude and the components of the indirect cost rate.

In November 1973, then Vice Chancellor for Academic Affairs Irving Shain sent to all faculty an extensive description of indirect costs. This included a description of the procedures used to arrive at the rates, the amounts of the various components of the indirect cost rate, including the contribution of each sub-category, and an explanation of how the indirect cost revenue was budgeted. Each subsequent alteration in the indirect cost rate has been accompanied by an analogous description of the change in each component of the indirect cost rate, as well as an explanation of what was perceived to be the reason for the changes.

Realistically, such communications have only a transitory existence on most faculty members' desks, and the precise numbers are retained only by a fastidious few. Despite this, it is felt that this information does have an important educational role. It is helpful to see the relative effects of such categories as departmental administration and libraries, for example.

A second step was taken a year and a half later, in April 1975, when Vice Chancellor Shain appointed an "Ad Hoc Advisory Committee on the Basis for Calculating Indirect Costs on Grants and Contracts". This committee was composed of eight faculty members, with five administrators serving as advisory staff. The committee was charged first with advising whether the salaries and wages base for indirect cost calculation should be changed to a modified direct cost basis. It was subsequently charged to review also how the indirect cost base is calculated and to consider whether such indirect cost charges are reasonably representative of costs incurred by the University.

After analyzing 125 grants and contracts, the committee concluded that there was no reason to prefer one base over another, and, since any change would create considerable dislocation, the committee recommended that the salaries and wages base be retained. The committee made a number of other recommendations designed to insure as much equity as possible in the application of the indirect cost rate, and also to ease the transition involved in a change of rate or basis. These recommendations have been followed in the implementation of A-21. A final recommendation called for either a permanent faculty advisory committee or else liberal use of ad hoc faculty advisory committees for discussion of specific issues relating to indirect costs and grant administration.

A-21 Implementation at the University of Wisconsin-Madison

In early 1978, the Office of Management and Budget published a proposed revision of Federal Cost Principles identified as Circular A-21. Since it was apparent that this extensive revision of the cost principles would have far-reaching consequences at the University of Wisconsin-Madison, Chancellor Shain appointed an ad hoc faculty committee to study the implications of these proposed regulations and to develop a response. In contrast to the previous committee on indirect costs, this group contained both faculty and administrative staff as full members, since it was clear that some of the changes had primarily administrative consequences. The group attempted to identify some outstanding problems with the proposed changes, and to focus on these.

The response which this group provided was similar in many respects to that from a number of other institutions. Although some of the concerns expressed were indeed answered by the final regulations, several problems remained in the final version. The work of this committee, while extremely valuable for the institution, is of interest here primarily as a foundation for a succeeding committee, which addressed the problems of compliance with the final version of A-21.

This final version, published on March 9, 1979, clearly required several significant modifications in the handling of research grants and contracts at the University. It should be noted that an HEW audit had concomitantly required a modification of the effort reporting system along the lines adopted in A-21. The necessity to make these changes suggested that immediate attention be given to all phases of A-21. Accordingly, an enlarged ad hoc committee on compliance with A-21 was formed, consisting of those faculty who had served on the commentary committee, augmented by several other faculty. Various administrative personnel served as staff to this committee. This group organized into subcommittees to consider effort reporting, the handling of tuition changes as a direct cost, and the problems of transition to the MTDC base. This set of topics varied somewhat from those considered by the previous committee. Several of the faculty involved either held joint administrative-faculty positions or had previously had administrative experience. Others represented research areas where particular problems could be expected to arise.

This committee designed the effort reporting system which has now been implemented, developed a method for the direct-charging of out-of-state tuition remissions on an average basis, and provided a set of guidelines for easing the transition to the MTDC base. Members of this committee are still consulted concerning particular problems of implementation of A-21.

It is still too early to assess fully the success of the efforts made to involve the faculty in this decision process. For example, grants awarded prior to July 1, 1980, are still charged indirect costs on a salaries and wages basis, and are not charged for tuition remission. Only now are faculty being required to submit the first set of reports on their own effort, covering the summer of 1980. Nevertheless, a set of procedures which appear to be reasonable has been created. The identification of problems which had not occurred to administrative staff indicates that these procedures are probably superior to those which would have been developed in the absence of the faculty committee.

Conclusions

The admittedly-incomplete experience at the University of Wisconsin-Madison suggests first that it is very important to inform faculty of the nature of indirect cost charges and their basis, as well as the other requirements of grant and contract administration imposed on the University. This may seem obvious, but the necessity to regard this as a continuing problem of education may be overlooked.

Secondly, the faculty have both a right and a responsibility to be involved in decisions which affect the rules under which their grant and contracts are administered. The overall parameters of these rules may not be changed, but it is frequently possible to optimize the system with the help of principal investigators' perspective.

One small note of caution must be expressed. There are many demands on the time of faculty members, and responsibilities on committees such as those discussed above, while taken seriously, may not have first priority. Administrative staff concerned with these decisions may well have these same responsibilities as a top priority. Consequently, committees and sub-committees can be dominated by the staff members through sheer weight of numbers, assuming the usual faculty time conflicts. It is necessary to recognize this in planning for committee membership, as well as in the conduct of meetings.

Throughout the discussion presented here attention has been focused on a particular insitution, the University of Wisconsin-Madison. Some characteristics which may be peculiar to that insitution, as described previously, may have contributed to any success which efforts there are enjoying. Indeed, the very diversity of educational insitutions which is one of this country's greatest strengths also makes a generalization from one institution to another dangerous.

Nevertheless, there is a commonality of interest of both administration and faculty in obtaining the maximum research from available resources, be they federal, state, or private. A clear realization of this commonality, as well as an appreciation and understanding of the problems each group faces, can materially aid in achieving that maximization in a responsible fashion.

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[1] Prepared by Marvin E. Ebel, Professor of Physics and Associate Dean of the Graduate School, for presentation at the meeting of the Advisory Committee to the Director, NIH, October 20-21, 1980.

Presentation to the NIH Director's Advisory Committee on Proposed HHS Debarment Regulations--October 21, 1980

In order to put the topic of debarment in its proper perspective, I should emphasize at the outset that the regulations I am going to briefly describe will have little impact on the scientific community in general. They are designed to deal with the very infrequent situation in which a person's prior conduct has been so improper that NIH can no longer reliably place Federal funds at that individual's disposal.

While most scientists and institutions act responsibly and in good faith in carrying out their grant responsibilities, unfortunately, each year NIH learns of a few situations in which individuals have seriously breached the trust placed in them by the award of grant funds. Although technically the regulations apply to both individuals and institutions, I have yet to see a situation in which debarment of an institution was warranted. Consequently, in my talk I will refer primarily to individuals.

Just to give you some idea of the types of cases that have troubled us through the years, we have, for example, been faced with instances in which the principal investigator required employees and trainees to "kickback" to the PI part of the salaries and stipends charged to the PI's grants. In other cases, grant funds were used, for example, to buy building materials, drugs, and groceries for the PI's personal use. Recently, a PI used training grant funds to pay for ski trips for himself and his son.

Although the examples I just mentioned dealt with strictly financial irregularities, we have also had cases in which the conduct at issue reflected negatively on the PI's scientific integrity. The most common problem in this area is falsification of research data. Again, however, I should emphasize that while these events occur, the total number of cases is small.

In a few instances, the offenders have actually been convicted of violations of criminal law. However, most cases involved only a few thousand dollars, or less, and the Justice Department, in view of its limited resources, has directed NIH to deal with most of these matters through civil and administrative procedures, rather than seek criminal convictions.

When improper use of money is involved, one obvious step for NIH to take administratively is to recoup the diverted dollars. Also, under existing regulations we can terminate ongoing grants where there has been a material failure to comply with the terms and conditions of the awards.

However, we have up to now had no established mechanism for dealing with new applications submitted by a PI who has previously been found to engage in activity which raises serious question as to his or her fiscal or fiducial integrity.

For many years, other agencies have had debarment regulations to fill this gap. The legality of these regulations has been confirmed in a number of court decisions.

At this point I should indicate, for those of you who are not familiar with the term, what "debarment" actually means. In the grant context, when someone is debarred, the person involved is in effect excluded from eligibility for financial assistance from the granting agency for the period of the debarment.

The debarment regulations have a twofold purpose:

1. They put in place a regularized mechanism for determining, in cases of fraud or abuse, whether the respondents should continue to be eligible for Department grant support or whether the respondents should be debarred.

2. They also provide a forum in which the respondents can present their side of the story to an independent fact finder and decisionmaker, and in effect have "a day in court."

To give you just a little history regarding the regulations, they were developed on instructions from the Secretary of the then Department of HEW, after the Secretary became aware of several cases in which scientists had made improper use of grant funds. The content of the initial drafts of the regulations was discussed extensively within the Department, including at NIH, and then a notice of proposed rulemaking was published in the Federal Register in 1979, for the purpose of seeking public comment before the regulations were finalized. A number of comments were received from other Government agencies, universities, colleges, educational organizations, and a few individuals. Some commenters simply opposed the regulations, while others just made suggestions for clarification or other improvement. Following the comment period, a policy decision was made by the Department that the regulations were needed, but a number of changes were made to take account of the public comments. The final regulations appeared in the Federal Register on October 9.

The causes for debarment set forth in the regulations fall into four basic categories: First, conviction of various fiscal-type crimes, such as violation of antitrust statutes, Second, debarment by some other Government agency, Third, serious violations of statutes, regulations, or grant terms and conditions, and Fourth, similar conduct of a serious nature.

In each case, before someone may be debarred, the offender is entitled first to notice that debarment is contemplated and the nature of the charges. Also, before debarment can occur the offender is entitled to a hearing before an independent hearing officer who has had nothing previously to do with the matter. Except where the debarment is based upon a criminal conviction or previous debarment by another agency, the Government is required at the hearing to present "clear and convincing evidence" to support its charges. And the offender is given a full opportunity to present his or her "side of the story," to rebut the Government's case, and to present mitigating evidence for purposes of placing what happened in a more favorable light than may appear on the surface.

The hearing officer is required to render a decision which either side may then appeal to the Secretary herself. If the Secretary decides to become personally involved, the regulations require that any changes she makes in the hearing officer's decision be based solely on the record developed at the hearing conducted by the hearing officer.

If the final decision is favorable to the respondent, then the Department will not take into account the events which were the subject of the debarment proceedings in making funding decisions on applications by the respondent.

On the other hand, if the Government has prevailed, then the debarred person will be ineligible for discretionary awards of financial assistance from the Department during the period for which the person is debarred.

In this fashion, the accused will have had a full opportunity, in accordance with "due process," to defend himself or herself, but if he or she loses, the Government will not have to waste time and money processing applications in accordance with normal grant review procedures, when the application will inevitably not be funded.

The regulations also provide a mechanism for suspension pending debarment when immediate action is necessary before debarment proceedings can be completed. However, if such a step is taken, the individual must then be offered a hearing on the suspension, which then will be lifted if the Department is unable to justify the need for suspension.

Since the regulations have only recently been finalized, the Department has not yet addressed the details as to how they should be implemented. Nevertheless, I should make just a few comments on the subject of implementation at NIH.

First and foremost, debarment proceedings will not even be started unless it is clear that improper activity has occurred.

If a decision is made to take such a step, however, unnecessary delays should be avoided so as to minimize the time during which a respondent will be left uncertain as to his or her status.

At this stage, no categorical rule can be laid down as to whether applications from respondents will be deferred pending completion of debarment proceedings or allowed to continue through the review process. Decisions on how to handle specific cases will necessarily depend on such factors as: the nature of the alleged misconduct, how far along the application was in the review process when the improper conduct was discovered, and whether any adverse program impact might result from deferring a particular application.

As is indicated in the paper passed out to you, NIH believes that unproven allegations of improper activity should not be disseminated to those involved in the review process except on a "need to know" basis.

Although it is difficult to develop hard-and-fast rules to deal with these types of situations, in general NIH does not plan to notify study sections and other scientific review groups of alleged violations or pending investigations. Once an investigation is completed a study section might be provided with factual information resulting from the investigation, but only if it bears directly on the scientific merit of an application or proposal under review.

However, because the National Advisory Councils and Boards have broader advisory responsibilities, they will be made aware of the existence and current status of investigations bearing on applications and proposals brought before them. But it should be emphasized that in most instances questions regarding fitness of the applicant will have been resolved before the application is taken to the Board or Council -- normally by deferral of the application if necessary.

In closing, I want to underscore the fact that these regulations are common in Government, but they are rarely used, and then only against serious offenders. HHS already has a set of debarment regulations for contractors that has been on the books for years. No one has, to my knowledge, ever been debarred under them. Other agencies, I am told, have in a few instances debarred someone, but it is a rare occurrence.

Nevertheless, once in a great while debarment is warranted, but an agency must already have the procedure in place in order to do so. The only purpose in adopting the regulations at this time is to fill this gap in the Department grant regulations.

It is a protection for the respondent, as well as for the Government, since it requires the Government to accord the respondent very specific rights before debarment, whereas a more informal process could have the same effect of cutting the person off from Government benefits, without any "due process."

federal register

Thursday
October 9, 1980

Part III

Department of Health and Human Services

Office of the Secretary

Debarment and Suspension From Eligibility for Financial Assistance

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office of the Secretary

45 CFR Part 76

Debarment and Suspension From Eligibility for Financial Assistance

AGENCY: Department of Health and Human Services.

ACTION: Final rule.

SUMMARY: HHS hereby amends Title 45 by adding a new Part 76 authorizing debarment and suspension of individuals and institutions from eligibility to receive grants or other forms of financial assistance under HHS discretionary programs. These regulations are necessary because there have been instances of fraud or abuse by persons who are responsible for Federal funds, and the effect of the regulations will be to establish a procedure, with due process safeguards, to render these persons ineligible to receive HHS financial assistance for reasonable periods of time.

EFFECTIVE DATE: November 10, 1980.

ADDRESS: Requests for information or a copy of the regulations may be addressed to the Legal Advisor, NIH, Office of the General Counsel, Room 2B-50, Building 31, National Institutes of Health, 9000 Rockville Pike, Bethesda, Maryland 20205.

FOR FURTHER INFORMATION CONTACT: William G. Ketterer, Senior Attorney, NIH. Address: Same as above; telephone (301) 496-6043.

SUPPLEMENTARY INFORMATION: On March 19, 1979, the Secretary of Health, Education, and Welfare (now the Secretary of Health and Human Services) published in the Federal Register (44 FR 16444) a notice proposing regulations governing the debarment and suspension of individuals and institutions from financial assistance for specified causes and subject to due process safeguards.

The notice provided 60 days opportunity for written comment from interested members of the public. Although some comments were received after the expiration date, all comments have been considered in preparation of the final regulations.

Overview of the Comments

Thirty-two letters of comment were received from the following sources: 3 local school districts, 5 State government agencies, 13 universities or colleges, 9 other educational organizations, and 2 concerned individuals. Although many comments were flatly opposed to any regulations on debarment (generally because they felt that existing procedures were adequate), some letters generally supported the adoption of *some* form of debarment procedure, but offered specific comments for clarification and improvement. All the comments have been carefully considered in adopting the final regulations.

A discussion of the comments received and the Secretary's action with respect to them follows:

(1) *Sufficiency of 5 U.S. Code § 301 as authority.* Several comments questioned whether the authority cited for the regulations, 5 U.S. Code § 301, is legally sufficient. Section 301 authorizes the heads of executive agencies to "... prescribe regulations for the government of his department, the conduct of its employees, the distribution and performance of its business, and the custody, use, and preservation of its records, papers, and property." While this authority is general in nature, the Secretary believes that establishment of reasonable debarment and suspension procedures to protect limited public funds for financial assistance is in furtherance of the performance of HHS's "business" of administering financial assistance programs authorized by Congress. The alternative would be to restate separately each statutory authority for every affected program, which is impractical.

(2) *Are the Regulations Necessary?* Numerous comments questioned whether the regulations are necessary and whether they merely duplicate other HHS regulations and procedures which are presently available to correct fraud and abuse in the assistance area (for example, normal audit procedures, and procedures for termination of ongoing grant awards under 45 CFR Part 74, Subpart M). These procedures deal with fraud and abuse after they have occurred and the Secretary believes that, in order to provide the maximum protection of Federal funds, there should be an across-the-board mechanism for the *prevention* of fraud and abuse. By excluding irresponsible applicants from the award process, the Secretary believes that limited public funds for assistance purposes will be available where they will be used properly.

With regard to overlapping debarment procedures under particular programs (for example, termination of eligibility of postsecondary institutions for student financial assistance under 45 CFR Part 168), the Secretary agrees that the regulations should take into account and, in response to a comment, § 76.10(g) [renumbered 76.10(f)] has been revised to include a prior outstanding debarment from financial assistance by a Government agency (including an agency within HHS) as cause for instituting a Department-wide debarment. Conforming changes have also been made to § 76.12(b). As in the case of prior contract debarment, the period of debarment would run concurrently with the period of debarment under the particular program concerned. The Secretary believes that it makes little sense for a person debarred from Government contract awards or financial assistance under one program, to continue to be eligible for financial assistance under the other numerous discretionary programs administered by HHS.

(3) *Failure to list these regulations in HHS's Semiannual Agenda of Regulations.* Two comments pointed out that the debarment regulations were not listed in HHS's Semiannual Agenda of Regulations published in the Federal Register for January 19, 1979 (44 FR 176), which is now required by Executive Order 12044. The Secretary regrets this omission which was entirely inadvertent and due to inadequate "tracking" of the regulations in the course of development. However, the public was not harmed by this omission because the notice provided full 60 days opportunity to comment, as required by the Executive Order and, although numerous comments were received after the expiration of the comment period, *all* comments received in response to the notice have in fact been considered.

In this connection, also, one commenter requested a hearing on the issues prior to publishing regulations in the area. The Secretary believes that the 60 day comment period has provided opportunity for public participation, and that such a hearing would only serve to further delay publication of regulations; the request is therefore denied.

(4) § *76.10(d) and (e) "unsatisfactory performance" and "serious" violations of statutes, regulations, terms and conditions as causes to debar.* There were several objections to § 76.10(e) authorizing debarment on the basis of "unsatisfactory performance" on a previous award as being ambiguous and subjective. In response, the criterion "as determined under the terms and conditions or specifications the prior awards" has been added to the provision, and, of course, a respondent will be afforded opportunity at a hearing to challenge a proposed debarment for unsatisfactory performance.

In response to a staff comment on paragraph (e), the provision has also been expanded to cover awards of contracts and subcontracts.

Objections on grounds of ambiguity were also raised with regard to the use of the word "serious" at several places in § 76.10. Although clarifying changes have been made, the term has been retained. Because of the numerous programs covered by these regulations, the term was chosen to leave room for administrative discretion, but requires an affirmative finding of seriousness before debarment action may be initiated.

The use of the term "serious" is intended to limit debarment to causes involving matters of importance, or which have important or dangerous possible consequences. The following examples, which are not exhaustive, are given to illustrate this meaning: (1) the misappropriation of grant funds for personal benefit, such as financing personal trips unrelated to the purpose for which the funds were awarded, (2) willful failure to comply with record retention and access requirements of regulations in order to frustrate examination or audit by the Government, including destruction of relevant documents, and (3) intentional falsification of research reports in order to meet deadlines, comply with the terms of awards, or secure personal or professional advantage.

It is believed that the standard thus affords a measure of protection to persons because insubstantial and minor violations would *not* be basis to debar, and even material violations must be determined to be sufficiently serious in nature to justify debarment action.

(5) § *76.10(f) Discriminatory practices.* Most comments objected to the ground "discriminatory practices," as introducing a new mechanism and procedures for enforcing civil rights laws, which already have their own specific regulations and procedures for determining discrimination (see, for example, 45 CFR Parts 80 and 81 relating to nondiscrimination under Title VI of the Civil Rights Act of 1964). Others felt that this ground was not consistent with the primary purpose of the regulations, which is to eliminate fraud and fiscal abuses.

Although it would be possible to modify the provisions relating to unlawful discrimination to limit debarment on those grounds to the terms and scope of a previous court or administrative order, this would not constitute a general debarment which is the intention of the regulations, and might lead to confusion. Accordingly, proposed § 76.10(f) and related provisions of the regulations have been deleted, and debarment for discriminatory practices under the statutes listed below or under Executive Order 11246 is outside the scope of these regulations:

(a) Title VI of the Civil Rights Act of 1964 (42 U.S. Code § 2000d et seq.);

(b) Title IX of the Education Amendments of 1972 (20 U.S. Code § 1681 et seq.);

(c) Title VII and VIII of the Public Health Service Act (42 U.S. Code §§ 292, 298);

(d) Age Discrimination Act of 1975 (42 U.S. Code § 6101); and

(e) Discrimination on the basis of handicap (section 504 of the Rehabilitation Act of 1973; 29 U.S. Code § 794).

Debarment from eligibility for financial assistance under the above listed statutes and Executive Order 11246 will be in accordance with the terms of any order issued pursuant to those statutes or Executive Order 11246.

(6) § *76.10(h) [renumbered § 76.10(g)] "Catch-all" lacks criteria.* Many commenters objected to the "catch-all" provision as being ambiguous and encouraging abuse of discretion. The Department does not agree. While the provision is indeed broad, because of the variety of programs covered by these regulations and the myriad of situations which may arise, it is essential to be able to handle unpredictable circumstances.

(7) *Should the regulations include a detailed implementing administrative structure, including points of contact?* This is viewed as an internal administrative matter which is not appropriate to include in the regulations. *All* normal channels for receiving and investigating complaints of fraud or abuse in grants would be available, for example, the relevant program office, the Office of the Inspector General, and the Office of the General Counsel. In addition, HHS reserves the right to undertake appropriate investigations of financial assistance programs upon its own initiative.

(8) *Are the regulations a penalty or punishment?* While the Secretary agrees that the regulations are stringent, the Secretary does not agree that they constitute a penalty or punishment because they are intended and will be used (1) solely to protect the interests of the United States and (2) they apply only to "discretionary programs" which are specifically defined to exclude programs under which an applicant is entitled to assistance as a matter of law. The courts have recognized the nonpunitive nature of debarment actions as follows in *Gonzalez* v. *Freeman*, 334 F. 2d 570 at 576, 577 (1964):

> The question presented is whether Commodity Credit is powerless to terminate business relations with irresponsible, defaulting or dishonest contractors. *Notwithstanding its severe impact upon a contractor, debarment is not intended to punish* but it is a necessary "means for accomplishing the congressional purpose" of Commodity Credit to "aid in the development of foreign markets for agricultural commodities." (emphasis added).

(9) § *76.13 Imputing conduct of individuals to their institution.* It was suggested that § 76.13(b) (relating to conduct within the scope of one's employment) and (c) (relating to debarrable conduct of individuals) should include the express requirement that the individual be *knowingly* involved. The comment is accepted with respect to paragraph (c) which deals with circumstances under which an individual may be *personally* debarred for participating in conduct for which the institution employing that individual may be debarred. Paragraph (b), however, deals solely with the issue of imputing conduct of an individual performed within the scope of employment, to his or her employer, and the key factor here is whether the employer knew or should have known of the conduct in question. To clarify this the word "or" in the sixth line of paragraph (b) has been changed to "and," so as to read "* * * where such conduct was accomplished within the scope of authority or employment *and* under circumstances in which responsible officials of the institution knew or should have known of the conduct."

Pursuant to another comment, the terminology of paragraph (b) has been improved to read "scope of authority or employment" (in lieu of "course of his or her official duty"). Parallel changes have also been made to § 76.21 relating to suspensions.

Other comments questioned the fundamental fairness of charging an institution with the errant conduct of its employees. Holding an employer responsible for the actions of its employees, committed within the scope of employment, has long been accepted for purposes of liability under the general law of agency and this appears *all the more applicable* where, as is the case with financial assistance, the institution often stands to benefit financially from the dishonest acts of its employees. Indeed, it is the institution which is in the best position to take corrective measures and, in response to a comment in this regard, paragraph (b) has been amended to require that remedial action by responsible officials of the institution be taken into account in determining whether institutional debarment is warranted. Also, under § 76.12(c), change of ownership or management, or correction of the underlying grounds for which debarment was imposed, are grounds to terminate a debarment. Reference to (change of) "responsible personnel" has been added to the provision to make it explicit that this too would constitute a basis to terminate debarment.

(10) *Applicability to State and local government agencies.* Several comments objected to applicability of the regulations to public institutions, i.e., State and local government agencies, although most comments felt they should be treated the same as private organizations. The Secretary recognizes the serious implications of rendering a State agency subject to debarment for the wrongful conduct of its employees. But in light of the fact that the regulations are limited to *discretionary* awards, which are awarded solely on the basis of merit or program need, and do not affect nondiscretionary awards, there is no apparent reason why such agencies should not have to compete on an equal basis with, and be subject to the same constraints as, the private sector for the limited Federal dollars available. Also, as previously noted, where the affected individuals are removed from positions of authority, this would be a basis for terminating debarment under § 76.12(c).

A related question was also raised whether violation of the terms and conditions of a mandatory formula grant (i.e., an entitlement) would theoretically serve as a basis to debar from *discretionary* awards under § 76.10(d). The answer is yes, in light of the broad definition of "financial assistance" (which includes all grants), but this again would *not* affect the debarred institution's continued eligibility for awards to which it may be entitled as a matter of law.

Also, § 76.13 has been expanded to make it clear that, when an institution is the subject of a debarment action, the Secretary would normally limit the debarment just to those components of the institution which were involved in or actually responsible for the conduct leading to debarment.

(11) § *76.17 and* § *76.24 Publication in Federal Register of the results of debarment and suspension actions.* Several commenters objected to publication in the Federal Register of the results of debarment and suspension actions, especially publication of the names of persons debarred and suspended. Several felt that this rendered debarment and suspension actions punitive in nature contrary to § 76.1(a); on the other hand, others expressed the view that *additional* information should be so published, including details concerning hearings, periodic lists of names of *formerly* debarred persons, and the amount of any monies involved. Several comments questioned the need for any public notice concerning debarment and suspension actions.

The purpose of publishing this information in the Federal Register is (1) to inform the public of a significant action taken to protect the public interest, and (2) to provide constructive notice to grantees and others responsible for administering HHS funds so that they can implement the restrictions set forth in §§ 76.16(c) and 76.23(c) barring participation by debarred and suspended individuals under financial assistance programs.

One comment supporting Federal Register publication noted, "* * * secrecy in government is a tool which is all too often abused. In all likelihood, most cases of debarment are the final result of at least one public hearing." The Secretary agrees that the public has a right to know, through publication in the Federal Register, the results of proper governmental actions taken to protect the public interest. Additionally, § 76.17(c) and § 17.24(c) provide for the maintenance of a current consolidated list of debarred institutions and individuals for purposes of administering affected discretionary programs.

(12) § *76.22(f) Suspensions—hearings.* Several commenters felt that the regulations failed to provide due process hearings in cases of suspensions. Indeed, one comment stated that there could be a suspension for up to 18 months in cases of criminal indictment without opportunity for a hearing. Post-suspension hearings are guaranteed for *all* suspensions upon request of the suspended party under § 76.22(f) and such hearings are required to be conducted, to the extent practical, in accordance with the debarment procedures set forth in §§ 76.14 and 76.15. Furthermore, although the courts have expressly upheld summary suspensions for cause for up to one month without any opportunity for a hearing (see *Horne Brothers, Inc.* v. *Laird*, 463 F2d 1268 (1972)), the regulations exceed this standard by affording a prompt hearing to suspended persons. However, as proposed, § 76.21(a) may give the impression that the period and scope of suspensions are determined without reference to the results of any hearing held pursuant to § 76.22(f), and this has been corrected in the final regulations.

(13) *Applicability to persons involved in criminal activity not involving Federal funds; application to affiliates.* It was felt by several commenters that the regulations should not apply, as they do, to persons convicted of criminal activity not involving Federal funds (for example, conviction of fraud in connection with attempting to obtain a *private* contract in § 76.10(a)).

The Secretary believes that any fraudulent criminal activity in connection with contracts clearly demonstrates a lack of business integrity and therefore may warrant debarment from stewardship over public funds which, in the final analysis, is a public trust. Of course, it should be noted that under the regulations debarment and suspension only preclude future awards during the specific period of debarment or suspension, after which the person would again be eligible to apply for and receive financial assistance. In response to a comment, this point has been clarified in § 76.1(c).

The suggestion that the regulations set forth required minimum periods of debarment for particular offenses is not accepted, because the Secretary believes the regulations should be as flexible as possible in this regard.

Another comment questioned the fairness of including affiliates at all; but it should be noted that, as defined, affiliates are institutions which *control or are controlled* by another institution or individual and they are guaranteed the same notice and opportunity for hearing under § 76.13(a). Similarly, the decision to initiate debarment, which is a drastic remedy, is left to sound discretion of the Secretary in § 76.10, and the suggestion that the Secretary "must" debar all individuals and institutions for the enumerated causes in § 76.10 is rejected as impractical and unnecessarily harsh. For the same reason, other suggestions which would severely limit the discretion of the Secretary to *decline* action, or unduly restrict the Secretary's choices within the regulatory framework have been rejected.

(14) *Hearing procedures.* Numerous suggestions have been made to modify the hearing procedures, chiefly to the benefit of the respondent institution or individual. For example: that HHS should bear the *full* costs of hearings to respondents (including costs of travel expenses and legal counsel, and provision of transcripts without charge), that respondent should choose the place of hearing or that it should always be at the site of the affected institution, that

there be more than one hearing examiner, that there be more specific time intervals stated, that there be an appeal as a matter of right to the Secretary and beyond the Secretary. Although § 76.15(b) has been modified to assure respondents a right of appeal to the Secretary, most of these other suggestions are rejected as not necessary to assure due process. In addition, as the result of staff comment, the Secretary has revised the final rule to provide that hearings shall be conducted by a hearing officer (who shall be an officer or employee of HHS not previously involved in the matter), and the notice provisions have been modified to authorize notice by personal service, as well as by registered or certified mail.

(15) *Clarifying, technical and editorial changes.* In response to a staff comment, the definition of "financial assistance" in § 76.2 has been clarified to explicitly cover assistance in the form of property and services, as well as awards of funds.

We have also added clarifying language to § 76.11(d) to remove an apparent inconsistency with § 76.15(c). While debarment may be based solely on proof of debarment from contracting by another government agency (which is a matter of public record), § 76.11(d) would permit HHS to develop any additional facts it deems appropriate at the HHS debarment hearing. The fact of prior debarment (as well as any other facts proferred by HHS) will be fully subject to rebuttal by the affected parties at the HHS hearing. The affected parties could also introduce evidence and offer argument on whether the reasons for the prior debarment by another agency warrant debarment under this regulation. Section 76.23(a), setting forth general restrictions during suspensions, has been revised in response to a staff comment to conform more closely to the parallel provision § 76.16(a) governing general restrictions during debarments.

In addition, several other clarifying, technical and editorial suggestions were offered. These have been accepted where possible and are reflected in the final rule.

Title 45 Code of Federal Regulations is therefore amended by adding a new Part 76, as set forth below:

Dated: August 21, 1980.

Patricia Roberts Harris,

Secretary.

PART 76—DEBARMENT AND SUSPENSION FROM ELIGIBILITY FOR FINANCIAL ASSISTANCE

Subpart A—General

Sec.

76.1 The scope and purpose of these regulations.
76.2 Definitions.

Subpart B—Debarment

76.10 Causes for debarment.
76.11 Conditions for debarment.
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76.15 Procedures—Determination of hearing officers; review by Secretary.
76.16 Restrictions on debarred institutions and individuals.
76.17 Publication of notice in Federal Register of results of debarment actions.

Subpart C—Suspension

76.20 Causes for suspension.
76.21 Period and scope of suspension.
76.22 Notice of suspension.
76.23 Restrictions during period of suspension
76.24 Publication of notice in Federal Register of results of suspension actions.

Authority: 5 U.S.C. 301.

Subpart A—General

§ 76.1 The scope and purpose of these regulations.

(a) *Debarment.* Subpart B prescribes policies and procedures relating to debarment for cause of public and private institutions or individuals (and their affiliates) from eligibility under discretionary programs of financial assistance which are awarded or administered by HHS. Debarment is invoked to exclude institutions and individuals from participation in HHS discretionary programs of financial assistance to protect the interests of the Government, and is not intended to be a penalty or punishment. This measure shall be instituted only for as long as necessary to protect the interests of the Government and financial assistance is precluded only during the period of debarment.

(b) *Suspension.* Subpart C sets forth the procedures for temporary suspension of institutions or individuals (and their affiliates) from eligibility under HHS discretionary programs of financial assistance. Because it is a drastic step taken upon what may be incomplete information, it shall be used cautiously and only when the Secretary believes that grounds for debarment exist (or there is an outstanding indictment for a criminal offense which is grounds for debarment) and there are compelling reasons why immediate action must be taken before debarment proceedings can be completed. In assessing whether adequate evidence exists for invoking suspension, consideration shall be given to the evidence available, to the existence or absence of corroboration as to allegations, as well as to the inferences which may properly be drawn from the existence or absence of facts and the irreparable nature of the harm caused by continuing the institution's or individual's eligibility pending debarment proceedings. This assessment shall include an examination of basic documents, such as contracts, grants, inspection reports, and correspondence. A suspension may be terminated or modified whenever it is determined to be in the interest of the Government to do so.

(c) *Relationship to other program responsibilities.* The regulations of this part deal solely with the debarment and suspension of individuals and organizations for future awards and do not limit the discretion of agency officials to take into account the fiscal and administrative capabilities of applicants in connection with particular applications for financial assistance. Termination and suspension for cause of ongoing grants are separate matters which are governed by HHS's grant administration regulations, 45 CFR Part 74, Subpart M. However, debarment and suspension under this part precludes all future awards during the period of debarment or suspension, including competitive and noncompetitive renewal, supplemental, and continuation awards, of financial assistance for a previously supported activity.

§ 76.2 Definitions.

As used in this part:

"Affiliate" means an institution which controls, or is controlled by, or is under common control with, another institution or individual. For example, a university foundation and the "parent" university are affiliates if one has the power to control the other with respect to the conduct for which debarment or suspension is sought.

"Discretionary program" means a program of financial assistance which is awarded on the basis of merit or program need and to which an applicant is not entitled as a matter of law.

"Debarment" and "debarred" mean the exclusion from eligibility for financial assistance awarded or administered by HHS under discretionary programs for a reasonable, specified period of time, commensurate with the seriousness of the cause resulting in the debarment.

"Financial assistance" means grants and awards of funds, services, or property (including fellowships, traineeships and National Research Service Awards), cooperative agreements, loans, loan guarantees, and interest subsidies, including competitive and noncompetitive renewal, supplemental, and continuation awards for any of the foregoing.

"HHS" means the Department of Health and Human Services and its operating agencies and component organizations.

"Individual" means a natural person.

"Institution" means any public or private corporation, agency, organization, or institution, which would otherwise be eligible to receive financial assistance under HHS discretionary programs.

"Respondent" means an institution, individual or affiliate who is the subject of a debarment action under §§ 76.14 and 76.15.

"Secretary" means the Secretary of Health and Human Services and any officer or employee of HHS to whom the authority involved has been delegated.

"Suspension", unless the context otherwise requires, means an immediate exclusion from eligibility for financial assistance under discretionary programs without prior hearing pending completion of debarment or other proceedings, as applicable.

Subpart B—Debarment

§ 76.10 Causes for debarment.

Subject to the conditions set forth in § 76.11 and the procedural requirements set forth in §§ 76.14 and 76.15, the Secretary may debar an institution or individual, and any affiliate thereof, in the public interest for any of the following causes:

(a) Conviction for any criminal offense committed as an incident to obtaining or attempting to obtain a public or private contract or any form of financial assistance (or subcontract or subgrant thereunder), or as an incident to performance of any contract, or any form of financial assistance (or any subcontract or subgrant thereunder);

(b) Conviction under the Organized Crime Control Act of 1970, or conviction for embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which seriously and directly affects the question of present responsibility to account for or administer Federal funds;

(c) Conviction under the Federal Antitrust Statutes arising out of the submission of bids, applications or proposals;

(d) Serious violation of the applicable statute, regulations, or other terms and conditions of a previous award of financial assistance;

(e) A record of serious unsatisfactory performance (or failure to perform) under one or more prior awards of financial assistance, contracts or subcontracts, as determined under the terms and conditions or specifications of the prior awards, except that unsatisfactory performance (or failure to perform) caused by acts beyond the control of the institution or individual shall not be considered a basis for debarment;

(f) Debarment from Government contracting, subcontracting, or financial assistance, by a Government agency (including an agency within HHS);

(g) Any other cause significantly affecting responsibility as a recipient or participant under a Federal program of sufficiently serious nature as determined by the Secretary to warrant debarment.

§ 76.11 Conditions for debarment.

(a) *General.* Unless otherwise required by law, the existence of any of the causes set forth in § 76.10 does not effectuate a debarment or necessarily require that an institution or individual be debarred. In each instance, a decision to debar shall be made within the discretion of the Secretary and shall be rendered solely in the best interest of the Government. In addition, mitigating factors, such as the degree of seriousness of the offense, violation, failure, or inadequacy of performance, will be considered in deciding whether debarment is warranted.

(b) The existence of a cause set forth in § 76.10(a), (b), and (c) (relating to conviction of criminal offenses) shall be established by proof of judgment of criminal conviction by a court of competent jurisdiction. In the event that an appeal taken from such conviction results in a reversal, debarment shall be removed on the Secretary's own motion or upon the written request of the institution or individual concerned (unless other cause for debarment exists).

(c) The existence of causes set forth in § 76.10(d), (e), and (g) (relating to violation of grant terms and conditions, performance, and other causes) shall be established by evidence which the Secretary determines to be clear and convincing in nature.

(d) Debarment on the cause set forth in § 76.10(f) (relating to debarment from Government contracting, subcontracting, or financial assistance) may be based entirely on the determination of debarment by the initial debarring agency, or upon a combination of this determination and additional facts.

§ 76.12 Period of debarment.

(a) *General.* Debarment for causes other than debarment from contracting, subcontracting or financial assistance under § 76.10(f) shall be for a reasonable, definite period of time commensurate with the seriousness of the offense, violation, or failure or inadequacy of performance, as necessary to protect the interests of the Government.

(b) *Contract and other prior debarments.* Where debarment is based upon prior debarment from contracts, subcontracts or financial assistance, the period of debarment shall run concurrently with the period of the prior debarment.

(c) *Termination or reduction of period.* Except where prohibited by statute, debarment may be terminated, or the period thereof may be reduced, by the Secretary, on the Secretary's own initiative or upon the submission of an application, supported by documentary evidence, setting forth appropriate grounds for the granting of relief, such as newly discovered material evidence, reversal of conviction, bona fide change of ownership, management, or responsible personnel, or the elimination or correction of the underlying grounds for which the debarment was imposed or other mitigating circumstances. The Secretary may require, as a condition to termination of the debarment period, restitution to HHS by the debarred party for losses sustained by HHS.

(d) *Reinstitution of debarment.* Except where debarment is based upon conviction of a criminal offense, at the end of the termination period the Secretary may reinstitute debarment, through the debarment procedures set forth in this subpart, if the causes have not been corrected or adequate assurance given that the practices will not be repeated.

§ 76.13 Scope of debarment.

(a) *Institutions.* When an institution is the subject of a debarment action, the Secretary may limit the debarment just to those components of the institution which were involved in the conduct leading to debarment.

(b) *Affiliates.* A debarment may include affiliates of an institution or individual which have had notice and opportunity for a hearing in accordance with §§ 76.14 and 76.15. Each decision to include a known affiliate within the scope of a proposed debarment is to be made on a case-by-case basis, after giving due regard to all the relevant facts and circumstances.

(c) *Imputing conduct to institution.* Conduct of an individual may be imputed to the institution, or responsible component of the institution, with which he or she is associated by employment or otherwise, where such conduct was accomplished within the scope of authority or employment and under circumstances in which responsible officials of the institution knew or should have known of the conduct. However, remedial action taken by responsible officials of the institution shall be taken into account in determining whether debarment of the institution is warranted. The institution shall be entitled to notice and opportunity for a hearing in accordance with §§ 76.14 and 76.15.

(d) *Individuals involved in debarable activities.* Where an institution is involved in conduct justifying debarment under this part, any individual who was knowingly involved in the commission of the conduct in question may also be debarred. The individual shall be entitled to notice and opportunity for hearing in accordance with §§ 76.14 and 76.15.

§ 76.14 Procedures—Hearings.

(a) *Initiation of action.* When the Secretary seeks to debar an institution or individual, or any affiliate thereof (called "respondent" for purposes of §§ 76.14 and 76.15), respondents shall be served with written notice from the Secretary by personal service or registered or certified mail, return receipt requested. The notice shall:

(1) State that debarment is being considered;

(2) Set forth the reasons for the proposed debarment and the proposed length of time; and

(3) Indicate that the respondent will be accorded an opportunity for a hearing if the respondent so requests and the request is received within 30 days after the date of mailing or service of the notice to the respondent's last know address.

(b) *Hearing.*—(1) *Request for hearing.* Any respondent that has been notified of a proposed action is entitled to request an opportunity to be heard and to be represented by counsel. A hearing request shall be made in writing addressed to the Secretary or other official proposing the action. If at the end of the 30 day period referred to in paragraph (a)(3) of this section, no request has been received, it may be assumed that an opportunity to be heard is not desired, and the Secretary shall proceed to make a final determination and so notify the respondent.

(2) *Notice of hearing.* Upon receipt of a request for an opportunity to be heard, the Secretary shall appoint a hearing officer and the hearing officer shall arrange a prompt and timely hearing. Notice of the time and place of such hearing shall be in writing, transmitted by personal service or registered or certified mail, return receipt requested, and shall include a statement indicating the nature of the proceedings and their purpose. The hearing officer shall determine the place for the hearing. In determining the hearing place, the hearing officer shall consider the convenience of the parties and the public interest.

(c) *Hearing procedures.* (1) Hearings shall be conducted by the hearing officer, who shall be an officer or employee of HHS not previously involved in the matter.

(2) HHS shall be represented by the General Counsel or designee.

(3) A transcribed record shall be made of the proceedings and a copy shall be made available to the respondent upon request, upon payment of any appropriate fee prescribed under the HHS Freedom of Information Act regulations (45 CFR Part 5).

(4) Formal rules of evidence and procedures applicable to proceedings in a court of law will not be applied.

(d) *Scope of hearing; sufficiency of evidence.* The scope of the hearing and sufficiency of evidence shall be governed by the applicable provisions of § 76.11.

§ 76.15 Procedures—Determination of hearing officers; review by Secretary.

(a) After completion of the hearing, the hearing officer shall make a written determination on the evidence presented, including where appropriate the extent to which the determination applies to affiliates named in the action. The hearing officer's determination shall be transmitted to the Secretary, and to all respondents by personal service or registered or certified mail, return receipt requested.

(b) The hearing officer's determination shall be final unless within 60 days the respondent requests the Secretary, or the Secretary decides on the Secretary's own motion or at the request of the General Counsel, to review the findings of the hearing officer.

(c) Where a review is granted, the determination by the Secretary shall be final and shall be based solely on the record of the hearing. It shall fully recite the evidentiary grounds upon which the Secretary's determination is made.

(d) Each determination shall become part of the record.

(e) Notice of the Secretary's decision to review the hearing determination and subsequent determination by the Secretary, shall be given in writing to all respondents by personal service or registered or certified mail, return receipt requested.

§ 76.16 Restrictions on debarred institutions and individuals.

(a) *General restrictions.* Institutions and individuals (and their affiliates) debarred under this subpart shall be ineligible during the period of debarment to receive any form of financial assistance under any discretionary program awarded or administered by HHS; applications or requests for financial assistance received under any discretionary program shall not be considered and shall be returned with a statement of the reasons. However, when it is determined essential in the public interest by the Secretary, an exception may be made to permit an institution or individual to apply for and receive support under a particular program on the same basis as other eligible applicants under the program concerned. In addition, where grounds exist, the Secretary may also proceed to terminate or suspend for cause ongoing funded grants awarded to a debarred grantee, as authorized by 45 CFR Part 74, Subpart M.

(b) *Subcontracting and subgranting.* Debarred institutions and individuals shall be ineligible to receive contracts, subcontracts and subgrants under any form of financial assistance awarded or administered by HHS, and the responsible HHS official and recipients of financial assistance, as applicable, shall decline to approve contracting, subcontracting, or subgranting with that institution or individual, unless it is determined by the Secretary to be essential in the best interests of the Government to grant such approval.

(c) *Individuals.* Debarred individuals shall be ineligible to serve or participate under any form of financial assistance awarded or administered by HHS under discretionary programs including service or participation in the conduct or performance of those awards or in the administration of Federal funds. Recipients of financial assistance shall be responsible for compliance with this provision, which constitutes a condition of all awards of financial assistance. Applications for financial assistance proposing debarred individuals to serve as principal investigators, project directors, or those responsible for the administration of Federal funds, or in any other capacity, shall not be considered and shall be returned to the applicant with a statement of the reason therefor.

§ 76.17 Publication of notice in Federal Register of results of debarment actions.

(a) *Contents.* When an institution, individual, or affiliate is debarred under this subpart, HHS shall publish a notice in the Federal Register containing as a minimum the following information:

(1) The names of the debarred institutions, individuals, and affiliates, and their addresses;

(2) The authority under which the action was taken and a brief statement of the reasons for the action;

(3) The extent of restrictions imposed, including effective dates; and

(4) The termination date.

(b) A notice shall also be published in the Federal Register when a debarment is ended prior to its specified termination date.

(c) The Secretary shall also establish and maintain a current, consolidated list of debarred institutions and individuals for purposes of administering affected discretionary programs.

Subpart C—Suspension

§ 76.20 Causes for suspension.

(1) Whenever the Secretary believes that grounds for debarment exist (or there is an outstanding indictment for a criminal offense which is grounds for debarment under § 76.10), and, in order to protect the interests of the United States, immediate action is necessary, the Secretary may suspend an institution, individual, and any affiliate thereof, in accordance with the applicable procedures of this part. This action shall be taken by the Secretary only where there are compelling reasons why the interests of the United States would be jeopardized by waiting for completion of debarment proceedings under Subpart B.

§ 76.21 Period and scope of suspension.

(a) A suspension shall be for a temporary period pending the completion of an investigation or hearing, and any administrative or legal proceedings as may result. Unless earlier terminated as the result of a hearing held pursuant to § 76.22(f), the period and scope of suspension shall be as follows:

(1) Except where suspension is based on criminal indictment, debarment proceedings shall be initiated within 6 months after notice of suspension, in accordance with Subpart B, or the suspension shall be terminated automatically. When the debarment proceedings are initiated within the 6-month period, the suspension shall continue in effect pending the completion of debarment proceedings or for a period not to exceed 12 months after the date of the notice of proposed debarment, whichever first occurs.

(2) When suspension is based upon criminal indictment, it may continue until completion of the criminal proceedings, or for 18 months, whichever first occurs.

(b) Suspension may include all known affiliates of an institution or individual who have received notice and opportunity for hearing as set forth in § 76.22.

(c) A decision to include affiliates in a proposed supsension is a separate determination which shall be made on a case-by-case basis.

(d) The conduct of an individual may be imputed to the institution, or responsible component of the institution, with which he or she is associated by employment or otherwise when the conduct involved was performed within the scope of authority or employment and under circumstances in which responsible officials of the institution knew or should have known of the conduct. However, remedial action taken by responsible officials of the institution shall be taken into account in determining whether suspension of the institution is warranted. The institution shall be entitled to notice and opportunity for a hearing in accordance with § 76.22.

(e) *Individuals involved in activities resulting in suspension.* Where an institution is involved in conduct justifying suspension under this part, any individual who was knowingly involved in the commission of the conduct in question may also be suspended. The individual shall be entitled to notice and opportunity for a hearing in accordance with § 76.22.

§ 76.22 Notice of suspension.

When an institution or individual or any affiliate thereof is suspended, the Secretary shall furnish all the affected parties immediately with a notice of the suspension by personal service or registered or certified mail, return receipt requested. The notice of suspension shall state that:

(a) The suspension is based on (1) an outstanding indictment for a criminal offense which is grounds for debarment under § 76.10 or (2) reasonable evidence that the institution or individual has committed irregularities of a serious nature which would be grounds for debarment under § 76.10 (the notice shall identify the indictment or describe the nature of the irregularities, in general terms, without disclosing the Government's evidence);

(b) The suspension is for a temporary period pending the completion of debarment or other proceedings, as applicable;

(c) Bids, proposals, and applications for financial assistance will not be solicited or accepted from the institution or individual and, if received, will not be considered, and awards of any form of financial assistance under HHS discretionary programs may not be made unless it is determined by the Secretary to be in the best interest of the Government;

(d) The institution or individual will not be eligible for the award of a subcontract or subgrant. Whenever the institution or individual is proposed as a subcontract or subgrantee, the responsible HHS official will decline to approve subcontracting or subgranting with that institution or individual in any instance in which consent is required of the Government before the subcontract or subgrant is made, unless it is determined by the Secretary to be in the best interest of the Government to grant approval;

(e) The suspension is effective throughout HHS, and

(f) A hearing as to whether the suspension should be continued will be provided upon request of the institution or individual or any affected affiliate. The hearing shall be conducted, to the extent practical in accordance with the procedures set forth in §§ 76.14 and 76.15.

§ 76.23 Restrictions during period of suspension.

During a period of suspension of an institution or individual and any affiliate, the following policies and procedures shall be applicable:

(a) *General restrictions.* Institutions and individuals (and their affiliates) suspended under this subpart shall be ineligible during the period of suspension to receive any form of financial assistance under any discretionary program awarded or administered by HHS; applications or requests for financial assistance received under any discretionary program shall not be considered and shall be returned with a statement of the reasons. However, when it is determined essential in the public interest by the Secretary, and exception may be made to permit an institution or individual to apply for and receive support under a particular program on the same basis as other eligible applicants under the program concerned. In addition, where grounds exist, the Secretary may also proceed to terminate or suspend for cause ongoing funded grants awarded to a suspendad grantee, as authorized by 45 CFR Part 74, Subpart M.

(b) *Subcontracting and subgranting.* Suspended institutions and individuals shall be ineligible to receive contracts, subcontracts and subgrants under any form of financial assistance awardad or administered by HHS, and the responsible HHS official and recipients of financial assistance, as applicable, shall decline to approve contracting, subcontracting or subgranting with that institution or individual, unless it is determined by the Secretary to be essential in the best interests of the Government to grant such approval.

(c) *Individuals.* Suspended individuals shall be ineligible to serve or participate under any form of financial assistance awarded or administered by HHS under discretionary programs, including service or participation in the conduct or performance of those awards, or in the administration of Federal funds. Recipients of financial assistance shall be responsible for compliance with this provision, which constitutes a condition of all awards of financial assistance. Applications for financial assistance proposing suspended individuals to serve as principal investigators, project directors, or those responsible for administration of Federal funds, or in any other capacity, shall not be considered and shall be returned to the applicant with a statement of the reason therefor.

§ 76.24 Publication of notice in Federal Register of results of suspension actions.

(a) When an institution or individual is suspended under this subpart, HHS shall publish a notice in the Federal Register containing as a minimum the following information:

(1) The names of the suspended institutions and individuals, and any affiliates, and their addresses;

(2) The authority under which the action was taken and a brief statement of the reasons for the action;

(3) The extent of restrictions imposed, including affective date; and

(4) Statement that the suspension is for a temporary period of time, pending the completion of debarment or other proceedings, as applicable.

(b) A notice shall also be published in the Federal Register when a suspension is ended.

(c) The Secretary shall also establish and maintain a current, consolidated list of suspended institutions and individuals for purposes of administering affected discretionary programs.

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FUNDING MECHANISMS:

Balancing Objectives and Resources in University Research

National Commission on Research
May 1980

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Foreword

The National Commission on Research is a private, nonprofit organization established to examine the relationships between government agencies and universities involved in research and to develop specific recommendations for improvements. The Commission was founded in the latter half of 1978 by the American Council on Education, the American Council of Learned Societies, the Association of American Universities, the National Academy of Sciences, the National Association of State Universities and Land-Grant Colleges, and the Social Science Research Council. The Commission works independently of its founders to examine the process by which the Federal government supports academic research and to propose changes designed to improve that process.

Funding has been obtained for Commission activities to pursue this task from the following organizations: Carnegie Corporation of New York, Exxon Education Foundation, Ford Foundation, the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, the National Science Foundation (Grants Nos. PRM-7903778 and CDP-7926386), the U.S. Department of Energy (Grant No. DE-FG01-80ER10167) and the Air Force Office of Scientific Research (Grant No. AFOSR-ISSA-80-00030). Over three-fourths of the funding was made available by the five private agencies and approximately one-fourth from the public sources. Any opinions, findings, conclusions, and recommendations expressed in this publication are the sole responsibility of the Commission and do not necessarily reflect the views of any of the aforementioned funding sources or founders.

This publication on funding mechanisms is the second in a series of documents to be developed by the Commission to analyze the process of government funding and university involvement in research and to make recommendations to all affected parties for improvements in the system. Subcommittees of the Commission are investigating each of the following issues:

(1) Accountability;
(2) Peer review and other selection processes;
(3) Alternative funding mechanisms;
(4) Industry/university/government relationships; and
(5) Development of research personnel.

Position papers on each topic will be published by the Commission.

The members of the Subcommittee on Alternative Funding Mechanisms are Dale R. Corson, Chairman; Donald N. Langenberg; and Linda S. Wilson.

In addition to surveying the available literature, subcommittee members and staff meet with selected officials from business, government, and the universities. At monthly meetings, invited speakers present their views on pertinent aspects of the listed topics or on the broad purview of the Commission. The Commission has received testimony on five university campuses from faculty members and administrators, as well as written comments stemming from invitations to research universities and from an open letter in *Science* magazine. Liaison with numerous government agencies is maintained through telephone contacts, correspondence, and attendance at Commission meetings. Approximately one hundred fifty persons have given advice and information to assist the Commission in its study thus far. The Commission appreciates the efforts of all the participants in its deliberations and discussions. A description of these considerations and a partial list of individuals are contained in the Appendix.

The members of the Commission are listed inside the front cover. These individuals have backgrounds in education, business, and government. They have accepted appointments to serve on the Commission without compensation. During Commission deliberations, they reflect their own experience and not necessarily the viewpoints of their institutions or organizations.

Liaison persons have been designated to the Commission by the following government agencies: Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA); Department of Defense (DOD); Department of Energy (DOE); Department of Health, Education, and Welfare (DHEW); General Accounting Office (GAO); National Aeronautics and Space Administration (NASA); National Institutes of Health (NIH); National Science Foundation (NSF); Office of Management and Budget (OMB); and Office of Science and Technology Policy (OSTP).

In its series of publications, the Commission will review the key elements of the present state of federally supported university research, affirm what it believes to be good in this system, analyze problem areas, and provide suggestions for actions to alleviate these problems. The Commission recognizes that much diversity exists in the complex relationships among principal investigators, research administrators, and others in the university community, and program officers, auditors, administrators, and other government personnel. There is a wide range of beneficiaries, including industry, students, and the general public. The goals of the participating government organizations and educational institutions and of the concerned individuals involved in federally supported research are diverse and sometimes overlapping but not identical. Therefore, the Commission does not anticipate the ability to establish consensus on all of the issues. The Commission does seek to make a contribution to improved research in our nation by improving a system which produces a major portion of that research.

NATIONAL COMMISSION ON RESEARCH
Funding Mechanisms: Balancing Objectives and Resources in University Research

Executive Summary

For the better part of a half century, the Federal government and the research universities of the nation have been associated closely in the support and performance of research. Recently, this relationship has become strained. The partners have developed different views on the objectives of their association and the conditions of their collaboration.

The Commission

The National Commission on Research was formed in late 1978 as an independent body. It was sponsored by interested organizations and supported principally by private foundations. The Commission was charged to study the relationship between the government and the research universities, to determine the nature and origins of the problems afflicting the relationship, and to recommend ways to solve these problems. Additional information on the origins and purposes of the Commission is contained in the Foreword (p. ix).

Funding Mechanisms

The mechanisms through which the Federal government supports research performed in universities are operational embodiments of government policies. The success of the government-university research partnership depends critically on the degree to which these funding mechanisms are properly suited to the policies, purposes, and expectations of both partners. In this document, the Commission surveys the system of funding mechanisms currently in use, identifies problems in the system, and presents conclusions and recommendations for its improvement.

The Introduction (p. 1) describes the historical development of Federal government interest in support of research, particularly research performed in universities. The next section (p. 5) provides an overview of the system of funding mechanisms currently used to support academic research and describes the strengths and weaknesses of the system from the points of view of the government and the research universities. Next, specific problems in the current system of funding mechanisms are described (p. 15), including difficulties in the array of funding mechanisms and difficulties in the funding instruments which are a part of the mechanisms. Also discussed is the growing issue of university-based research centers and their potential effects on the character of the research universities (p. 23). Next, the Commission's conclusions are presented (p. 25). The final section contains an explanation of each recommendation (p. 29).

Conclusions

The Commission derived several conclusions from its study (p. 25).

1. *Essential Elements.* Several key elements are essential to effective functioning of the research support system, including agreement about purposes, diversity, and provision for new ventures and sustaining research capacity.
2. *Character of Agreements.* Government-university research agreements should include appropriate characteristics such as tailoring to the nature of the performer as well as the sponsor, and utilizing the predominant mode of assistance rather than procurement.
3. *Problems.* While the current funding mechanisms are basically sound, significant unresolved problems remain.
4. *Continuing Experimentation.* An effective system of mechanisms must adapt to changes in the needs and the environment. Revisions and experiments with improvements should be undertaken regularly.

5. *Mismatched Expectations.* A small number of policy issues remain a frequent source of mismatched expectations, particularly at the operating level. These include the appropriate means for developing research personnel and cost sharing by sponsors and recipients.

6. *Complexity.* The government-university research enterprise is so complex and varied that problems can be oversimplified and solutions misjudged. Care is required in developing changes which will attain intended benefits.

7. *Forum.* The preliminary suggestion made earlier by the Commission of a Forum of individuals concerned with the government-university research relationship has been well received. Further discussion to refine the concept is needed among interested parties.

Recommendations

1. *Equipment Obsolescence*
   The Commission recommends that the federal agencies and the universities adapt funding mechanisms and improve priority-setting strategies to solve the growing problem of research equipment obsolescence.

2. *Stability, Continuity, and Flexibility*
   The Commission recommends that Congress and the federal agencies develop and implement means to increase the stability, continuity, and flexibility of research support while retaining the capacity to respond to changing national priorities. The Commission offers several specific recommendations to this end:
   (a) The Commission recommends that Congress consider making a transition to a two-year appropriation cycle for those agencies and components of agencies which support basic research.
   (b) The Commission recommends that those agencies and components of agencies which support basic research lengthen the average duration of their basic research support agreements to at least two and preferably three years, if they have not already done so.
   (c) The Commission recommends that agencies experiment with authorizing program officers to award a limited number of non-renewable extensions of support at approximately the same level, without full renewal proposal submission and peer review.
   (d) The Commission recommends the introduction of incentives for funding agencies to provide more timely notices of awards.
   (e) The Commission recommends that agencies which fund large research programs build in forward-funding mechanisms or devise new ways to cushion the impact of termination of support.

3. *Research Capacity and Initiatives*
   The Commission recommends that the government and the universities work together to develop or adapt a funding mechanism to sustain the research capacity of universities, especially their capacity to undertake new research initiatives.

4. *Assistance As the Predominant Approach*
   The Commission recommends that the Federal government and the universities adopt the policy that assistance rather than procurement is the appropriate mode for support of university research, except where unusual circumstances specifically justify the use of the procurement mode.

5. *Experimentation with Mechanisms*
   The Commission recommends experimentation with new concepts in funding mechanisms as the government-university research relationship evolves. In particular, the Commission recommends experimentation with grants-in-aid managed at the local level.

6. *Cooperation within Institutions*
   The Commission recommends that the universities and the government seek ways to promote intra-institutional cooperation in all aspects of research operation. The Commission offers some specific recommendations toward this objective:
   (a) The Commission recommends that Congress authorize and the agencies develop arrangements for aggregating research projects for post-award administrative purposes.
   (b) The Commission recommends that the universities make concerted efforts to reduce internal friction and misunderstanding about indirect costs through education and full discussion of issues.
   (c) The Commission recommends that the method used by the National Institutes of Health for reimbursing indirect costs be adopted by the National Science Foundation and other agencies which interact significantly with universities.

7. *Cost-Sharing and Matching Requirements*
   The Commission recommends that Congress, the agencies, and the universities reexamine the rationale for cost-sharing and matching requirements in federal programs for support of research in universities to assure that any such requirements are constructive in furthering the mutual objectives of the government-university research relationship.

8. *Additional Science Indicators*
   The Commission recommends that the Office of Science and Technology Policy and the National Science Foundation (a) develop, employ, and report additional science indicators which reflect the balance and diversity of federal research funding programs and (b) encourage the general use of these indicators in research policy development and planning by government and universities alike.

9. *Growth of Research Centers and Institutes in Universities*
   The Commission recommends that the research universities, individually and collectively, examine carefully the implications for university development, structure, and governance of the growth of university-associated research centers and institutes.

Introduction

The United States government has played an active and often strongly debated role in the encouragement and support of research since the earliest days of the Republic.[1] The subject was discussed at the Constitutional Convention, with the result that the Constitution empowers Congress to "promote the Progress of Science and useful Arts," but then appears to narrow that power by specifying how, ". . . by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

In 1803, Congress appropriated funds in the amount of $2,500 to support a multidisciplinary investigation of the upper Missouri River. One of the project's principal investigators, Meriwether Lewis, broadened his expertise in preparation for the expedition by studying celestial navigation, zoology, botany, and ethnography with the learned members of the American Philosophical Society in Philadelphia. The Congress was evidently persuaded of the potential value of this study by President Jefferson's argument that it was "for the purpose of extending the external commerce of the United States," while at the same time being assured that this foray into foreign territories would be viewed by Spain and France as a mere "literary pursuit." To the Spanish minister Jefferson asserted that the expedition would "have no other view than the advancement of geography," while noting that in presenting his proposal to the Congress it would be necessary to "give it the denomination of mercantile, inasmuch as only in this way would Congress have the power of voting the necessary funds; it not being possible to appropriate funds for a society, or a purely literary expedition. . . ." Congress' rather modest direct appropriation was not the whole of the project's federal support; salaries and supplies were provided by the War Department.

Readers familiar with the research enterprise of the United States today will be struck by the way in which this early example of federally supported scientific exploration presages certain features of the modern scene. There is the use of expert advice from non-government scientists, the justifications in terms of practical benefit to a wary Congress and of scientific benefit to other interested parties, and the participation and support of a military service in the pursuit of objectives transcending any purely military mission. Additionally, there is the retrospectively evident importance to the nation of an exploration which before the fact must have seemed to many to be a frivolous waste of public money.

Other salient features of today's national research effort can similarly be traced to early origins. The Army and the Navy played prominent parts in the exploration of the continent and of the seas around it and sporadically supported science in support of their missions throughout the nineteenth century. In 1863, the National Academy of Sciences was founded, espousing as one of its purposes the bringing of science to the service of the government. A year earlier Congress had passed the Morrill Act, "donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." In 1887, Congress followed with the Hatch Act, providing federal support for agricultural experiment stations associated with the land-grant colleges developed as a result of the Morrill Act. These two legislative actions for the first time established the Federal government as a partner with academic institutions in a broad-based program to enhance the national welfare through research. The fruits of this century of partnership are no less astounding for being taken for granted by most American citizens. It has given the United States its original and perhaps most bountiful technology, American agriculture, which leads the world and is a major source of national strength.

The advent of the twentieth century brought a quickening of the pace of federal involvement in the support and performance of research. Two milestones among many are the establishment of the National Bureau of Standards in 1901 and the transformation of the Public Health Service's Hygienic Laboratory into the National Institute of Health in 1930. By the outbreak of World War II, the Federal government had become a major factor in the American research enterprise. The striking successes of that enterprise during the war are a familiar story. They led, after the war, to renewed public debate of the nature of the federal responsibility for support of scientific research. The character of this debate owed much to Vannevar Bush's eloquent arguments for the importance of public support for science and scientific institutions, presented in his report to the President, *Science—The Endless Frontier*. The debate resulted in the creation of the National Science Foundation in 1950.

The three decades since 1950 have brought an explosive expansion of federally performed and supported research. The nation currently invests about $50 billion (about 2.2 percent of the Gross National Product) annually in research and development (R&D); of this about half comes from the Federal government. Basic and applied research (the R in R&D) typically account for one-third of total national R&D expenditures; about two-thirds of the research total is for applied research, one-third for basic research.

One of the most significant features of the development of the national research effort since World War II is the emergence of the research universities as the principal performers of basic research. This was not accidental or unintended, but the result of conscious national policy decisions epitomized by the creation of the National Science Foundation with its mission "to develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences; and to initiate and support basic scientific research in the mathematical, physical, medical, biological, engineering, and other sciences. . . ." The research universities had embraced research as one of their principal missions since the latter part of the nineteenth century but, with the exception of agricultural research, had pursued this mission independent of any substantial government support before the late 1940s.

Today the situation is very different. The research universities of the nation number 50 to 150, depending on the criteria used. These institutions account for only about 10 percent of total national R&D expenditures but more than 50 percent of total national expenditures on basic research. The basic research figure rises to 60 percent if expenditures by federally funded research and development centers (FFRDC's) administered by universities are included. About three-quarters of the funds spent by universities on basic research are provided by the Federal government. Thus, over the last three decades the United States has moved purposefully to vest the greatest share of the responsibility for the creation of new knowledge, the seedbed of future technology, in a government-university partnership.

It is important to understand that this partnership is neither simple nor inevitable. On one side, there is the Federal government embodied in a diverse array of agencies, each with its own mission and its own perspective on the purposes of research. On the other side, there is a diverse array of research universities, some private and some public, but none a federal institution. With few exceptions, every agency and every university has functions, obligations, and constituencies which have little to do with the research which is the common concern of the partnership. This arrangement is almost uniquely American. Other countries have taken different paths. In most, all universities are government institutions and in many, institutions of the central government. In many, the system of basic research performers includes and is often dominated by publicly supported research institutes more or less unrelated to any university.

Any serious contemplation of the American system for the investment in and conduct of research and development raises many questions and issues. The federal role in this system particularly highlights these aspects. Few are new, and many first appeared in the earliest days of the nation. Among them are:

- Does the Congress have the power to provide funds in support of research? This constitutional question was actively argued in the early decades of the Republic. It appears to have been settled in the affirmative.
- Should Congress provide funds in support of research? This question also appears to have been settled in the affirmative, but more recently, and consensus on the question is far from complete.
- For what purposes should Congress provide funds in support of research?
- At what level should Congress provide funds in support of research?
- What is the best balance among basic research, applied research, and development?
- What is the best balance among different fields of science and technology?
- What is the best balance among federal agencies?
- What is the best balance among types of research performers?
- What is the best balance among types of support, e.g., support for specific projects, broad programs, institutions, or training of individuals?
- What should be the nature of the funding relationships between the Federal government and research performers?

All but the first of these questions have long been and can be expected to remain active subjects of national debate. The purpose of this report is to examine some of them in the context of a single element of the national research and development enterprise, the government-university partnership which has assumed the major responsibility for basic research. The report further focuses on one aspect of the partnership, the mechanisms through which the government provides and the research universities use public funds to support and perform research. It does so because these funding mechanisms are the operational embodiments of government policies toward university research. The success of the government-university research partnership depends critically on the degree to which the funding mechanisms are properly fitted to the policies, purposes, and expectations of both partners.

Over the past decade a variety of pressures and problems have led to increasing strain in the partnership. As detailed in the Foreword (p. ix), the independent National Commission on Research was established to review the state of the government-university research system and to seek ways to relieve the strains which have evolved. This report is the distillation of Commission thought on the issue of funding mechanisms and its bearing on the problem of reducing the strains and making the system more effective.

In the next section, the system of funding mechanisms currently used to support academic research is reviewed and comments are made on strengths and weaknesses of the various mechanisms from the points of view of the government and the research universities. This is followed by an examination of problems and issues in this system. The essential features of a good funding mechanism are described, as viewed by the Commission. The report then states conclusions of the Commission which identify ways in which the system can be improved and presents a series of recommendations for implementing the necessary changes.

Current System of Funding Mechanisms

An Overview of the System

Funding Mechanisms

In the years since World War II, many different mechanisms for the support of academic science have evolved, and many different federal agencies now participate in that support. The Commission has collected data about the forms of support used by various agencies and the amount of support by agency and by mechanism. It is important to collect such data and to analyze support by various agencies as the Commission has done because the relative emphasis placed by the various agencies on the differing forms of support is a statement of federal research policy. For example, to the extent that an agency has as its primary objective the strengthening of basic science and the support of individual scientists, the small research grant will be prominent. On the other hand, where the emphasis is on specific technological goals and the application of science and technology to societal problems, there will be greater reliance on research contracts and the support of research centers built around specific objectives.

Table I* shows the federal funds expended for university-performed research and development in Fiscal Year 1979. These are classified by agency source and by type of funding mechanism. There are listed below the six general mechanism types in our classification scheme.

Individual Research Projects

In this type, grant or contract awards are made to support work by a small number of investigators, often a single person. Awards are normally made to the investigator's university and are typically small relative to awards made through other types of funding mechanisms. This classification sets a rather arbitrary upper limit of $150,000 per year in defining an award as an individual research project. Such awards are based on proposals made by one or a few principal investigators. The research objectives are usually defined by the investigator rather than by the agency, and proposals are commonly evaluated through a peer review system. Most project research is performed within disciplinary departments of a university. Individual research project support accounts for almost half of all federal support for university research and development. Most of the work supported by this mechanism is basic research.

Research Programs

Where federal support is for a broad, coherent area of investigation, usually involving more than one senior investigator, and where the annual support exceeds $150,000, we have classified the support in this category.

Research Centers

Many agencies support university research organizations called "research centers" which undertake a research program in a particular, broad field of interest to the university and to a sponsoring agency. (The Categorical Disease Centers supported by the National Institutes of Health are an example.) The management of the center and coordination of specific research projects into a coherent research program are delegated to the university. Proposals for specific research projects carried on in the center may or may not be reviewed or approved individually by the federal agency.

Research on Problems Set by a Federal Agency

Federal agencies often identify areas within which they wish to have research or development performed and then seek proposals from prospective performers. The research is often of an applied nature, and the specification of the work to be performed is usually more tightly drawn than is the case in research centers. The support instrument is usually a contract rather than a grant.

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*The Commission is indebted to Dr. Charles V. Kidd of The George Washington University for help in compiling these data.

TABLE I:
FEDERAL FUNDS EXPENDED FOR UNIVERSITY RESEARCH BY AGENCY AND BY TYPE OF SUPPORT, FY 1979
(in millions of dollars)

					Large R&D Contracts			
Agency	Total	(1) Traditional Small Research Projects (Grant or Contract)	(2) Substantial Research Programs	(3) Research Centers	(4) R&D on Problems Set by the Federal Agency	(5) R&D Conducted in Very Large Facilities	(6) Broad Institutional Support	(7) Other
Total	$3,833[1]	1,815	465	551	492	159	258	95
NIH[2]	1,770	897	210	315	210		52	86[3]
NSF	602	494	42	32		34		
DOD	364	176	73	43	39	33		
HEW (other than NIH)	163	70	25	28	33			7
Energy	292	35	60	70	57	70		
Agriculture	206	15					191	
NASA	144	68	21	19	30	6		
AID	67	3	5	8	51			
EPA	50	3	8	10	29			
Interior	40	3	5	10	12	10		
Commerce	29	5	6	4	7		9	
DOT	19	6			13			
Other[4]	87	40	10	12	11	6	6	1

[1] Source: Special Analysis of the Budget of the U.S. Government, 1981, Special Analysis K. Research and Development, p. 311.

[2] Distribution by type for NIH assumed to be the same as in FY '78, which is the last year for which NIH has analyzed grants and contracts by type.

[3] Research career awards; minority biomedical research support.

[4] Distribution by type of support assumed to be the same as the distribution of all other agencies combined.

Large Facilities

This category refers to organizations which differ from research centers in that they are based on large, special, physical facilities or instruments, such as a high-voltage electron microscope or a nuclear reactor. The sponsoring agency often requires that the facility be made available to investigators from other universities. Contracts are normally used to finance these facilities, with provisions which enable the sponsoring agency to monitor closely the operation and use of the facility.

General Research Support

In this type of funding mechanism a federal agency provides funds to an organization to perform research in some general area or to maintain or strengthen its research capability. At present only two federal agencies provide such general research support, the Department of Agriculture (USDA) and the National Institutes of Health (NIH). The Department of Agriculture provides funds authorized under the Hatch Act for research in agricultural experiment stations. These funds must be matched by state appropriations. The experiment stations are attached to land-grant universities and have a relatively free hand in determining the specific research to be undertaken so long as it is agricultural research.

The National Institutes of Health Biomedical Research Support Program grants funds to eligible institutions for general support of health-related research in the biomedical sciences. The grants are awarded on a graduated formula basis related to the annual total amount of Public Health Service research project grant support awarded to the institution. An entitlement threshold and a ceiling limit the number of recipients and the size of the award. The program currently makes approximately 400 awards ranging from $25,000 to $200,000. Responsibility for allocation of the funds among eligible users is delegated to the grantee.

For a number of years the National Science Foundation (NSF) also awarded institutional grants for science on a formula basis, related to the total federal project research funding awarded to the institution. This program was discontinued in the early 1970s.

In the 1960s, the National Science Foundation provided another type of broad institutional support through a University Science Development Program and a Departmental Science Development Program. These programs were designed to develop "new centers of excellence." The Science Development grants were typically $5 million spread over a few years. The intent was to strengthen a major part of a particular university's science effort, and the grants usually embraced several departments of the institution. The Departmental Science Development Programs, on the other hand, focused on individual departments. Both types of grants were distributed widely around the country and were intended to benefit universities which were in a stage of development where substantial new funds could have maximum impact on the scope and quality of research effort. Universities which already had large, high quality programs and universities believed to be incapable of building significant quality with the funds available were not considered for these awards. These NSF programs also were eliminated in the early 1970s.

The two other types of funding mechanisms which follow are not included in the tabulation of Table I but are important components of federally funded university research.

National Laboratories

A considerable number of national laboratories have been established to perform research and development in major areas of national interest. These typically have their own large professional staffs which perform research, but they also develop and operate facilities which are used by university researchers from all over the nation. These laboratories include the Fermi National Accelerator Laboratory in Batavia, Illinois; the Brookhaven National Laboratory on Long Island; the National Radio Astronomy Observatory with sites at Charlottesville, Virginia, Green Bank, West Virginia, Socorro, New Mexico, and Kitt Peak, Arizona; the National Astronomical Observatory at Kitt Peak, Arizona; the National Center for Atmospheric Research at Boulder, Colorado; and others. These laboratories are usually operated by consortia of universities under contract to a federal agency.

Training Grants and Fellowships

Some federal agencies grant funds to universities or to individuals to support predoctoral or postdoctoral research training. The primary purpose of such grants is to assure the future availability of well trained researchers in general or specific areas where a national need is perceived. However, since individuals can be trained to do research only through actually doing research, training grants and fellowships contribute to the research productivity of the institutions in which the training takes place. Most such training is conducted at universities

Other Mechanisms

The categories described above are quite broad. Within these categories the federal agencies have developed a versatile array of distinct programs tailored to meet specific needs. For example, NIH has developed the Research Career Development Awards, which provide a period of uninterrupted research time to encourage and strengthen investigators of exceptional promise. NSF has developed doctoral dissertation grants to strengthen the quality of dissertation research in certain fields. NIH, NSF, and DOE (Department of Energy), have developed ways to aggregate closely related research projects into a research program via their "program project grants," "coherent area grants," and "cluster grants," respectively. NIH, NSF, and DOE offer special research initiation programs for new investigators. Many other examples could be cited.

Funding Instruments

In addition to the types of funding mechanisms described above, the various funding instruments used for the support of research also must be considered because the nature of the funding instrument can profoundly affect the performance of the supported activity. The principal instrument types are grants, cooperative agreements, and contracts. Other funding instruments are theoretically possible, such as loans, loan guarantees, and subsidies but these generally have not been used to support research in universities. Each of the principal types has a number of variations which differ with regard to the basis on which funds are provided, the degree of federal involvement in the definition and technical performance of the supported activity, and the specificity of the purpose of the contractual relationship. For example, the funds may be provided on a cost reimbursement grant-in-aid, or formula basis and involve various degrees of cost participation by the recipient. The degree of federal involvement may be minimal; it may involve shared direction and control; or it may involve federal oversight.

The federal procurement system for acquisition of goods and services for the benefit and use of the Federal government has evolved over many years. A comprehensive set of procurement principles and procedures has been developed, tested, and revised. A substantial body of procurement case law exists. Federal assistance programs, however, are a much more recent addition. No comprehensive system exists for their guidance and management. Nor has there been, until recently, any clear guidance regarding the appropriate choice of funding instrument for a given purpose. The result has been confusion in terminology and concepts, inconsistent practices, mismatch in expectations of performer and sponsor, and misunderstanding, especially regarding the nature and purpose of grants. Because the boundary between procurement and assistance has not been well understood, procurement-based requirements have frequently been used in assistance situations.

In 1972, the Government Procurement Commission recognized these problems and recommended that a study be undertaken to examine the feasibility of establishing a comprehensive system of guidance for management of federal assistance programs. The Federal Grant and Cooperative Agreement Act of 1977 (Public Law 95-224) codified that recommendation and mandated a study which has been completed just recently. In the intervening years, federal assistance programs have increased manyfold, primarily in assistance to state and local governments. Federal assistance activities are now carried out through more than 1,100 programs with an annual budget of over $100 billion, more than 85 percent of which is awarded to state and local governments.

The Federal Grant and Cooperative Agreement Act established two dichotomies: first, between assistance and procurement; and second, to divide assistance based on the involvement of the government in performance of the activity. The Act then mandated the use of contracts for procurement, grants for assistance without substantial involvement of the government, and cooperative agreements for relationships where the government is substantially involved.

Strengths and Weaknesses of the System

Funding Mechanisms

The objective assessment of the strengths and weaknesses of the system of mechanisms through which the Federal government supports university research is a difficult task. The difficulty is rooted in fundamental differences in objectives, functions, and philosophy between the government and the universities, and in the great diversity of agencies and institutions on both sides of the partnership.

The Federal government has for nearly two centuries rather consistently taken the position that it should support research only where the results of that research can be expected to satisfy a clearly identifiable national need. Jefferson's Congress was willing to support exploration "for the purpose of extending the external commerce of the United States" but not as a mere "literary pursuit." The Federal government long avoided any substantial involvement in education; George Washington's personal offer of an endowment for the establishment of a national university which would, *inter alia*, provide advanced scientific training, was rejected by Congress despite support by Jefferson and Madison. Support of learning for its own sake or of intellectual institutions as centers of national culture have never been popular notions in Washington. The tensions between the Federal government and the states, between elitism and populism, and between the theoretical and the practical, which have molded so much of the American character, have also strongly influenced the government-university research endeavor. The government funds research in support of its responsibilities for the security and welfare of the nation. Most federal agencies which support research have specific missions addressing one or more aspects of the government's responsibilities. In the cases of the National Science Foundation, the National Endowment for the Humanities (NEH), and the National Endowment for the Arts (NEA), the federal agencies' responsibilities are more broadly and generally defined than Jefferson's Congress might have found to his liking.

The extraordinarily fruitful collaboration between university scientists and the government during World War II led to the recognition of the potential of such cooperation for the public welfare. Our nation has also come to recognize both the importance of long-term investment in basic research and the relationship of scholarship and the arts to the intellectual and moral fiber of our people. Nevertheless, the fundamental interest in tangible results which promote the national welfare is never far below the surface.

Because of this basic federal philosophy, the federal agencies which support research tend to seek certain characteristics in funding mechanisms. There is a desire for control, equity, and consistency. There is a natural predilection for the more applied, the more predictable, and the lower risk research. In some cases, these desires lead agencies to treat expenditure of funds for research in the same way as expenditure of funds for the procurement of pencils or ships. In all cases, the need for proper accountability to the citizenry, in matters both scientific and financial, imposes constraints which an acceptable funding mechanism must satisfy.

The research universities operate from a different tradition and philosophy. Research and scholarship are commonly viewed as important ends in themselves, worthy of support, together with the institutions which nurture them, as a general public good without consideration of immediate practical usefulness. In matters of research and scholarship, the best is so incomparably better than the second best that universities put great emphasis on quality. Creativity is so highly valued that universities vest their researchers and scholars with considerable independence and freedom in choosing what research they will do and how they will do it. The universities' monastic origins and their modern status as non-profit, private institutions or as public wards of a state place most of them in delicate financial positions, subject to the fluctuating fortunes of a host of different patrons and clienteles.

The research universities thus often seek different funding mechanism characteristics than do the federal agencies. Flexibility to exploit scientific opportunities is important. Emphasis on scientific merit may lead to concentration of the available resources in the hands of a few outstanding researchers rather than spreading them widely among many. There is a tendency to regard most highly the more fundamental research and work with higher risk and higher scientific payoff. Where a university has come to depend heavily on federal support for its research effort, as most major research universities have, stability of support over time is important. Although most research universities invest substantial amounts of their own resources in support of research, the magnitude of these research efforts creates the need to maximize recovery of research costs from federal sponsors. The maintenance of close links between research and teaching, and the minimization of administrative burden are also important university objectives.

These differences between the objectives and perceptions of government agencies and the research universities mean that a particular feature of a funding mechanism may be a strength to an agency and a weakness to a university, or *vice versa*. As this report discusses the funding mechanisms defined above, it endeavors to describe them from both points of view.

Individual Research Projects

The backbone of the American science system which is conducted in universities is the individual project grant or contract, with almost half the entire federal support for academic science provided through this mechanism (cf. Table I).

There are many advantages to the individual project scheme. It gives an opportunity for a large number of investigators to seek federal funds on a competitive basis. The most worthy proposals, judged in a peer review system where the most informed scientific judgment can be brought to bear, can be selected for support. The relatively modest funding level typical of individual project grants or contracts permits support of a large number of individual investigators; this mechanism thus can distribute support relatively widely. The mechanism also provides an opportunity for many different agencies to support programs of interest to them. By supporting a large number of relatively small projects, federal agencies can have the flexibility to shift emphasis in research programs without disrupting large research enterprises. For a large research university, as many as 1,000 to 2,000 such projects is not uncommon. In these circumstances, fluctuations in total institutional funding will tend to be relatively small, therefore providing the appearance of stability. However, funding fluctuations at the level of individual investigators can be large.

On the other hand, the project system is a "retail" system, requiring decisions on tens of thousands of relatively small grants per year, and therefore involves a large amount of administrative detail for both the government and the universities. Each grant constitutes a separate agreement between a sponsor and a performer. Each requires individual review as well as scientific and financial accounting and reporting. This tends to segregate funds and scientific effort in small, impermeable compartments and creates a certain amount of rigidity and inflexibility. The system shifts to universities and academic departments the burdens of providing the resources required for the common support of many investigators, for coping with awkward gaps in research support, for supporting individuals and their research during periods when they have little or no external support, for helping younger investigators get started in research, for developing and maintaining research capacity, and for maintaining a proper balance among fields. These burdens are a necessary byproduct of the individual projects system, but institutional and external resources for addressing these needs have been sharply curtailed in recent years.

Research Programs

Although we have distinguished research programs from individual research projects in order to present a complete picture of the array of funding mechanisms, the strengths and weaknesses of the two mechanisms are similar. The larger size of research programs relative to individual research projects can reduce administrative burden for federal agencies, researchers, and their institutions. It can also increase the researchers' flexibility but may decrease funding stability in the institution.

Research Centers

Academic research, particularly in the sciences, encompasses much more than the basic research performed by individual investigators. Most major national research universities perform both basic and applied research, some of it requiring large and expensive physical facilities. Some of this work is carried on within academic departments, and agencies make large grants to departments, or to groups within departments, on a "wholesale" basis. In these cases, the departments or groups are responsible for the "retail" funding allocation decisions necessary in the execution of the research projects. DOE- and NSF-funded high energy physics and nuclear physics groups within university physics departments provide examples of this funding mechanism. In such cases, the peer review process includes a significant intra-department or intra-group element, and questions can arise about its breadth and objectivity. With competition for federal funds decided at the local level, intra-departmental relations may be strained.

The federal objective often involves research programs for which an academic department is not the best form of organization for pursuit of the research. To provide appropriate organizational arrangements in these cases, nearly every major research university has an array of research institutes, laboratories, or centers designed to bring multidisciplinary and interdisciplinary skills to bear on such research. These centers, whether based on a single discipline or several disciplines, can provide common services for a large number of investigators. Where center funding sources permit, a center can provide flexibility for individual investigators to change direction quickly when new research opportunities arise, as well as initial funding for young investigators and for mature investigators who wish to enter a new area of research.

University organizations for the performance of large scale research usually include a director who may be full or part time, and they usually provide for local policy guidance by a policy or administrative board. The organization generally provides for internal peer review as a part of the local funding allocation process. Federal oversight is commonly exercised through prior agreement with the institution about research focus, through external peer review of center proposals, and through periodic site visits by agency officials and external peer reviewers.

From the standpoint of the federal agencies, centers or similar, organized research units are an effective way of mobilizing universities for research work on problems of significance to the agency. However, there can be difficulties between the sponsoring agency and the university if the mission of the center is not clearly stated and mutually understood. Centers tie up large amounts of agency funds for long periods. While this is advantageous from the research support stability standpoint, it decreases the flexibility of the federal agency and limits the number of new directions the agency can undertake.

From the standpoint of the universities, centers offer a means of mobilizing resources more effectively than is possible within academic departments. Departments bear the responsibility for the curricular and teaching functions of the institution and provide the foundation for the system of faculty appointments and tenure. This gives the departments permanence but also a degree of rigidity. On the other hand, a proliferation of centers can blur the authority of administration in the universities.

Also from the standpoint of the university, major problems are apt to be generated when funds are withdrawn. The termination after Fiscal Year 1971 of the university centers funded for a decade by the National Aeronautics and Space Administration (NASA) in its Sustaining University Program is a case in point. The problem becomes particularly acute if tenured faculty members are supported on center funds. Many universities have elected to keep tenured faculty members on "hard" university money, and some universities have even established reserve funds in anticipation of possible withdrawal of federal funds.

The central research support services which the university has built up through the use of indirect cost reimbursements to meet the needs of a center are apt to represent a burden if the center is closed. Such services can rarely be dismantled or reduced as rapidly as the center's external support can be phased out.

The prospect of large scale support has sometimes led universities to accept support for a center without full consideration for the administrative responsibilities and complexities involved. Substantial financial risk is accepted when a grant or contract for a large center is accepted. Such agreements normally include termination clauses, usually providing for termination at the convenience of the government, with provision for reimbursement only of immediate termination costs.

While many university centers are supported through a combination of relatively small project and program grants, a number of federal agencies support large research efforts in specified areas at particular universities with block grants. These are grants which may include annual support of up to several million dollars awarded to the university, with the detailed administration of the grant delegated to the institution. Research programs supported with such grants include the National Science Foundation Materials Research Laboratories, created and originally funded by the Advanced Research Projects Agency of the Department of Defense (DOD); the National Institutes of Health Categorical Disease Centers; various large high-energy and nuclear physics research programs, some supported by the Department of Energy and some by the National Science Foundation; and the Department of Interior's Water Resource Research Centers.

The materials sciences provide a rare opportunity to assess the relative advantages and disadvantages of block-funded research centers and individual research project funding, because in this research area both mechanisms are used to a substantial extent. In 1978, the MITRE Corporation completed a massive comparative study of materials research conducted in the National Science Foundation's core-funded Materials Research Laboratories (MRLs) and materials research supported by project grants in other institutions. In the latter group, some institutions had separately organized Materials Science Centers and some did not. Also included were several interdisciplinary laboratories (IDLs) supported by the Department of Energy. The major conclusions of this study were:

- Universities with MRLs have a better capability (in terms of faculty and equipment) to perform materials research than non-MRL universities without Materials Science Centers. The capability of non-MRL universities with Materials Science Centers is much like the MRLs.
- From the viewpoint of total (university and NSF) administrative time and costs involved in administering grants, the MRL core grant mechanism is much more efficient than the project grant mode.
- About 70 percent of the materials research areas sponsored by NSF at the institutions surveyed show no overlap between MRLs and project-funded institutions.
- Research at the MRLs is more heavily oriented toward experimentation than research at non-MRLs without Materials Science Centers.
- There are no significant differences between MRLs and non-MRLs in concentration of funding, annual rate of turnover in research areas, duration of research areas, and continuity of staffing.
- The review of research publications does not show a clearcut dominance of one population over the others being compared. There is no statistically significant difference at the 90 percent confidence level among any of the populations with respect to interdisciplinarity and overall indicators of innovation. In quality of procedures, the NSF core-funded papers rank higher than project-funded ones. In contributions per paper to research or technology NSF core-funded papers rank lower than project-funded. In the use of essential specialized equipment, excluding computers, core-funded papers rank higher than papers from non-MRLs with Materials Science Centers but lower than papers from DOE/IDLs.
- Citation analysis shows that only NSF/Project-funded papers at MRLs were cited with significantly greater frequency than MRL core-funded papers. The latter were cited with about the same frequency as papers from DOE/IDLs and NSF/non-MRLs without Materials Science Centers.
- In major achievements, the MRLs have much more than a proportional share (based on total NSF funding) rated in the top 15 percent. However, the MRLs have slightly less than a proportional share of achievements rated in the top 25 percent.[2]

These conclusions do not demonstrate a clear superiority for one funding mechanism over the other. They do suggest that different funding mechanisms give rise to different ways of doing research and produce different kinds of science, and thus increase the diversity of the national research effort and expand the range of new knowledge available for application.

Research on Problems Set by a Federal Agency

When a federal agency identifies a problem requiring research, it usually can choose from among a variety of possible types of performer. It may have its own in-house laboratories, or it may consider contracting with a government laboratory belonging to another agency, an industrial laboratory, a federally funded research and development center (FFRDC), a university, or another non-profit research organization. A university may be the performer of choice because it may have special expertise or facilities, because it may offer lower cost, or because secondary benefits such as the training of researchers in a new area may also be valued. On the other hand, a university may be an unattractive choice because its commitment to teaching as well as research and its decentralized structure may make difficult mobilization of its resources within the desired time span.

From the university's point of view, the conditions which accompany an opportunity to work on a strongly focused government project may not be compatible with certain university principles and commitments. For example, the government may seek an unacceptable degree of control over the direction of a project or attempt to impose unacceptable restrictions on publication of results or on personnel matters. In such cases, the university's desire to be of public service must be weighed against the danger of compromising the basic institutional functions of instruction and research. The university's decision to become involved in research programs of this type will depend on the nature of the institution. It will generally be made on a case by case basis with due regard to the overall balance of the institution's research effort and the availability of faculty interested in the particular problem.

Large Facilities

From the government point of view, the establishment of a specialized research facility at a university may have several advantages: it places the facility within a community of skilled users, the environment may be made readily accessible to other users, and there are the collateral benefits of training in advanced techniques for research students. These same factors make the facility attractive to the university. However, the university may find it difficult to provide the managerial capacity required for a large facility and may be unprepared or unable to cover hidden costs which such facilities often entail. Again, some institutions will be better suited to house large facilities than others, and both the sponsoring agency and the university need to be fully alert to all the implications before entering into large facility agreements.

General Research Support

To a federal agency struggling to stretch limited funds over the largest possible range of high quality research, the option of providing funds for general support of research activities of a research organization is often unattractive or at least of low priority. From the agency's perspective, the use of this type of funding mechanism dilutes the agency's direct control over the use of its funds. It raises both concerns about quality assurance and fears that funds may be diverted to non-research purposes. On the other hand, decentralization of some allocation decisions is advantageous for the agency since it can reduce delays and administrative costs and increase the productivity of the funding system.

The universities see general research support as an important element of a balanced research funding system because it allows prompt and cost effective responses to the gaps inherent in the individual research project funding system. Emergencies, unexpected opportunities, new starts, and development of shared resources are typical funding needs which are inadequately addressed by the project system.

Individual investigators have mixed feelings about general research support. While they recognize the importance of the needs it addresses, they fear expansion of general research support at the expense of project support. Their primary concerns are quality assurance and preservation of the relative independence which their relationships with external sponsors provide.

Where local or regional needs and conditions are a key factor in determining what research should be done and how, as in agricultural research, general research support rather than centralized federal project support offers advantages.

National Laboratories

While the national laboratories are not university laboratories in a strict sense, they have a major impact on academic research. The large facilities represented by the national laboratories are usually operated as national facilities through consortia of universities for the benefit of academic research scientists. They are essential features of the scientific research enterprise of the nation. These laboratories provide large and expensive facilities, usually not easily accommodated at universities but vital for research in the fields they represent.

The relative allocation of funds between the national laboratories and university researchers is a frequent matter for debate. In astronomy, for example, approximately three-quarters of the National Science Foundation budget for support of research in astronomy goes to the five national centers or observatories: the National Astronomy and Ionosphere Center (Arecibo), the National Astronomy Observatory at Kitt Peak, the Cerro Tololo Inter-American Observatory, the National Radio Astronomy Observatory, and the Sacramento Peak Observatory. These funds support the operations at the observatories, which are used both by their own research staff members and by university researchers. While few would challenge the essential nature of these large laboratories, there are those who challenge two aspects of their operations. These are, first, the distribution in funds between the national laboratories and individual user projects and, second, a system which is sometimes perceived to afford research support opportunities to the national laboratory permanent staff without the stringent peer review evaluation required for proposals by individual project scientists. As with other aspects of the national research funding system, this is a question of seeking the best balance of characteristics among those available in the competing mechanisms.

Training Grants and Fellowships

Training grants and fellowships have generally been viewed by the Federal government as a means of encouraging the creation of a future supply of investigators rather than as a component of support for current research productivity. Consequently, the level of funding has undergone large fluctuations as perceptions of future manpower needs have changed. Shortly after the launch of Sputnik, the number of federally funded fellowships for scientists increased dramatically. An equally dramatic decrease occurred about a decade later; for example, the total number of fellowships and traineeships in physics went from over 2,700 in 1968 to fewer than 900 in 1975. The number of young investigators produced by our universities has not varied so rapidly nor so greatly as the number of fellowships and traineeships, partly because of the time lag associated with the long time required for development of a college freshman into a fledgling scientist and also because many students find other means of support such as part-time jobs, teaching assistantships, and research assistantships funded through individual research grants. Nevertheless, these large fluctuations in federally funded training grants and fellowships have contributed to instabilities in federally funded university research programs. Variations in graduate student support will continue to be of concern to both the government and the universities in the future. The difficulties of predicting manpower supply and demand and the complex and long delayed effects of any attempt to drive the system through changes in funding for training make this funding mechanism one to be manipulated only with great caution.

Funding Instruments

The assessment of the advantages and disadvantages of the use of grants, cooperative agreements, and contracts as the funding instruments for federally sponsored research in universities is sorely complicated by the variation among funding instruments carrying the same name. For example, an Office of Naval Research (ONR) contract for the support of basic research provides more flexible operation than certain grant arrangements with agencies which have predominantly "assistance" relationships. The dichotomies established by the Federal Grant and Cooperative Agreement Act, between procurement and assistance and between grants and cooperative agreements, yield an array which is neither benign nor malevolent to research. The clarity sought by the grant/contract dichotomy is too elusive to be reached only by the enactment of Public Law 95-224. The practices of agencies and the attitudes of their personnel are the principal administrative determinants of the ability of the awardee to carry out research effectively. Many researchers have made the point in testimony before the Commission that the characteristics and administration of an award (contract) from the Department of Defense are more like assistance than an award (grant) from the Department of Energy.

The attitudes of researchers and university administrators are also a significant factor. Both researchers and university administrators have been influenced by their experience with some agencies' practices in the use of these instruments. Biomedical research, for example, was long supported by NIH via grants. In the early 1970s, that agency markedly increased its use of the contract, a move that caused serious concern in the academic research community. The root of this concern lay primarily in the accompanying shift from researchers to the agencies of the locus of responsibility for deciding which problems were ripe for study, and in the selection of contractors without rigorous peer review. There was also concern about federal involvement in performance of the work and increases in administrative requirements. The NIH move to increased use of the contract mechanism was influenced by the plans for a war on cancer and heart disease and by an increased administrative emphasis on employment of management principles in all facets of federal activity. Much of the biomedical research community questioned the expectations that difficult scientific problems could be solved simply through application of money and management. In their view, this area of research was primarily in need of good ideas which could not be "managed" into existence. Many in the biomedical research community continue to resist or distrust the use of the contract as a result of this experience. The pendulum has recently swung back; NIH now makes much less use of the contract as a funding instrument.

Some contracts, such as those awarded by ONR for basic research, have been flexible enough to nurture exploratory work. Some grants, such as those awarded by the Office of Education and the National Endowment for Humanities, have provided little or no flexibility, especially with regard to internal budget changes during the award period. Some agencies, such as DOE, require in both contracts and grants frequent and burdensome technical and managerial reporting which may be appropriate for demonstration or development work, but which is unnecessary and unproductive for basic research.

Problems in the Current System of Funding Mechanisms

The establishment of the National Commission on Research was motivated by a growing perception among thoughtful observers of the American research enterprise that strains have developed in the government-university research partnership which seriously threaten its vitality. These strains have been discussed and documented by many authors, e.g., B. L. R. Smith and J. J. Karlesky in *The State of Academic Science—The Universities in the Nation's Research Effort*. The Commission has not undertaken extensive independent studies of its own, but has reviewed existing work such as the Smith-Karlesky report, and has interviewed numerous federal officials and university administrators and researchers. A partial listing of these individuals appears in Appendix II. A part of the picture which has emerged from our efforts concerns funding mechanisms. In general, the current system of funding mechanisms is viewed as basically sound and possessed of substantial strength derived from its diversity and flexibility. Nevertheless, close inspection reveals a variety of problems which call for attention from all the participants in the system. The system is not working as well as it could and should.

The shift from rapid expansion of research support through the 1950s and 1960s to the current state of tightly limited resources has necessitated changes throughout the government-university research enterprise and, in particular, this has brought questions of balance among types of research, sponsor, performer, and funding mechanism into sharp focus. Competition among fields of research, among institutional performers, and among individual researchers has become severe. Margins for flexibility and risk taking have dwindled and vanished. New initiatives can be considered only at the expense of continuing programs. Although none of these difficulties are unique to the research enterprise, their effects may be particularly damaging there because research cannot thrive in an atmosphere of stasis and conservatism. In considering specific problems in the funding mechanism system, we must keep in mind that their solution through substantially increased funding in real dollar terms is not likely. Instead, we must look for improvements which can be made within a generally constant funding environment.

The Commission has identified the following specific difficulties.

Difficulties in the Array of Funding Mechanisms

While the array of funding mechanisms includes a remarkable diversity of program types, some elements are missing. The missing elements are illustrated by three types of problems.

A Rapidly Developing Equipment Inadequacy Problem

American science is currently suffering from inadequate and obsolete equipment. Several factors contribute to this situation. First, development of new types of equipment has been unusually rapid in recent years because of the rapid development of measurement and instrumentation techniques. These developments are based in part on rapidly developing computer technology and on the maturation of other equipment technologies based on earlier scientific developments. The availability of entirely new types of equipment opens new opportunities to pursue the unknown, opportunities which cannot be exploited without the equipment. In many fields the ability to work at the frontiers depends entirely on access to the necessary equipment.

Following is an illustrative example: one of the byproducts of nuclear weapons development during and after World War II was the copious production of a variety of radioisotopes. The use of these radioisotopes as tracers in chemical and biomedical research has become a standard tool and has contributed enormously to advances in these fields. The equipment required to use this technique created a significant increase in instrumentation complexity and sophistication in these fields, but was nevertheless on a scale which could be afforded and used by individual investigators. The technique is not without disadvantages, not the least of which is the problem of disposal of radioactive experimental materials.

Another technique discovered shortly after World War II is nuclear magnetic resonance. Although it was developed and first used in physics, it too has become a standard tool in chemical and biomedical research. As a consequence of a long series of advances in electronic and computer technology and in such seemingly unrelated fields as superconductivity, nuclear magnetic resonance technology has now developed to the point where isotopic species can be identified and the amount of a particular species present in a sample measured with high sensitivity and accuracy. These developments now make it possible to use stable but rare isotopes as tracers in chemical or biomedical experimentation. This eliminates the requirement for radioactive tracers and the radioactive waste disposal problems which accompany their use. But there is a significant drawback: the equipment required costs on the order of a half million dollars and requires skilled operators and sophisticated maintenance.

This example illustrates three common characteristics of evolving instrumentation technology: the opening of new opportunities, the trend toward greater complexity and cost, and the presence of trade-offs among advantages and disadvantages.

A second factor contributing to the present serious equipment situation is a combined effect of the constant or decreasing total research funding of the past decade, coupled with increasing numbers of qualified researchers generated by the post-Sputnik drive to produce more scientific manpower. Hopes that the funding crunch will abate some day soon lead researchers repeatedly to defer capital acquisitions in favor of sustaining research personnel.

The origins of the "equipment crisis," as some term it, are many and complex, and solutions to the problem will not be found exclusively in improvements in funding mechanisms. Still, the structure of the current system of funding mechanisms has contributed to the problem. The typical funding level of an individual research project does not accommodate acquisition of any but the most modest types of equipment. Requests for substantial items of equipment in a proposal for such a project are often the first element deleted in the inevitable paring of a requested budget to an awarded budget. Such deletions usually are favored by both agency program officers and by the peer reviewers on whose advice they rely. To a considerable extent, both groups are strongly influenced by the desire to provide at least partial personnel and operating support to all the investigators whose work receives high scientific merit ratings. This favoring of people over equipment is intended to preserve the vitality of new ideas and to ensure continuity in training the next generation of research scientists.

The compartmentalization of individual research projects makes difficult the pooling of funds from different projects or by several individual investigators to purchase equipment for shared use. In some cases, sharing is further inhibited by the inability of institutions to remodel and renovate space in which to co-locate research groups to facilitate equipment sharing. It should be noted that a recent national survey[3] of shared use of scientific equipment at colleges and universities revealed that more than 45 percent have either already established systems to facilitate equipment sharing or plan to do so in the near future.

Although NSF has programs in which funds are segregated specifically for equipment grants, these are sometimes criticized by the research community because funds so identified are viewed as taken from sources otherwise available for support of conventional individual research projects.

Where funds are made available for major instrumentation for shared use within an institution or on a regional or national basis, other problems arise. Rarely do either the government or the institutional grantee adequately project and provide for the costs of housing, maintaining, and operating major equipment acquisitions. Over the lifetime of a major instrument, such costs can easily exceed by many times the capital cost of the instrument.

Neither government agencies nor research universities now have policies and mechanisms for coping with the general, long-term need to maintain the national research equipment inventory against the inevitable inroads of obsolescence.

The "equipment problem" has been the subject of repeated studies and comments.[4] Additional studies are in progress. The relative reduction in investment in equipment by funding agencies and its impact on institutions have been reported. For example, a typical midwestern public research university reports that the ratio of equipment expenditures from federal research funds to total federal research fund expenditures dropped from 14 percent in 1963 to 10 percent in 1973 and 5 percent in 1978. During the same period, inflation and increased complexity of research problems to be solved severely taxed resources for equipment. An NSF survey[5] recently showed that the cost of scientific instruments in five basic science areas has increased fourfold since 1970. The investment required to equip new investigators is becoming a major problem. The universities' own resources have become too limited to provide what is needed. "Young investigator" grants usually assume availability of major equipment, and hence often seek an end without providing the necessary means. Furthermore, many highly sophisticated instruments require technical personnel to operate the equipment or supervise its operation and maintenance. Present mechanisms for distributing costs of such personnel are inadequate. They frequently depend on prior involvement and an overall commitment which fewer and fewer institutions will be able to make. This is a serious flaw in the short-term and discrete project system of financing basic research.

The problem is escalating in severity. A steady state system is needed in which replacement of worn out and obsolete equipment is structured into consideration of project costs.

Inadequate Provision for New Research Initiatives and for Sustaining Research Capacity

Current heavy reliance on individual research project funding creates gaps in the research support system. Universities are increasingly unable to fill these gaps. Cost effectiveness often dictates shared use of research facilities, and such facilities are often too large to be supported by any single project. It becomes the university's problem to provide such facilities, but the institution has little or no means other than *post facto* indirect cost recovery over a period of years. Frequently, unexpected needs or opportunities arise in ongoing investigations with no available funds to meet these needs. There may be a hiatus between grants where only institutional funds can bridge the gap. Young investigators need initial support to establish a performance record so that they can compete effectively in national competition. Established scientists occasionally change the direction of their research and need temporary support while they develop credibility in the new field. From time to time, new research areas emerge and appear promising, but until exploratory work can be accomplished there is no adequate basis for a proposal for project support. At present, institutional funds are likely to be the only source of support for such exploratory work or for any of the research capacity needs described above.

Research universities acknowledge that they have a responsibility to maintain an environment conducive to the research of their faculty. They devote substantial resources to this end in addition to the research support received from the Federal government. However, the sheer magnitude of the federally sponsored research effort at the major research universities, together with increasingly stringent restrictions on funds from other sources such as tuition and state appropriations, has put most universities in a position where they can no longer maintain an adequate research infrastructure without additional aid.

The present array of funding mechanisms provides inadequately for venture capital and research capacity maintenance. Institutional resources alone cannot meet the need. Deterioration of the productivity of the research enterprise may well be inevitable if the problem is not addressed. The NIH Biomedical Research Support Grant Program is one successful example which might be extended to other fields of research.

Erosion of Institutional Support for Research in the Humanities and Social Sciences

Traditionally, much of university research in the humanities and social sciences has been in basic research and of relatively small scale. The primary resources needed are often simply time for research, access to libraries and data sets, clerical support, research assistance, and publication support. Such research makes an important contribution to national life and to world understanding, but the magnitude of the needs of individual projects makes a highly centralized individual project support system, like the one which is used in supporting science and engineering research, cumbersome, inefficient, and costly.

At present this research is supported primarily by universities and private sponsors such as the foundations and to a limited extent the Social Science Research Council (SSRC) and the American Council of Learned Societies (ACLS). Some federal support is provided to SSRC and ACLS, but these organizations rely primarily on the foundations for support. Federal support is directed almost exclusively to large-scale projects and development of research materials and research resources, although a modest fellowship support program is available for research in the humanities. Several universities have established successful institution-based award programs for small-scale research. Some of these are targeted exclusively for the humanities.

Although the federal support of social science research as a fraction of total federal research and development support has remained essentially constant for a number of years, this support is not directed to small-scale research. Furthermore, a recent NSF review of this situation revealed a noticeable change in the distribution of federal social science research support among types of performer. Researchers in universities have received less of the support in recent years, while independent consulting organizations have received more. The character of the social science research undertaken with federal support also has changed, with a significant fraction now being highly targeted to address specific agency policy questions. These changes, therefore, increase the demand on universities and private sponsors for more general social science research support.

The present resources for small scale research in humanities and social sciences are quite limited. If adjustments are not made, the outlook for the future appears worrisome. Within universities, enrollment shifts away from the humanities and social sciences disciplines create pressures for resource reallocation to meet enrollment increases elsewhere. Economic pressures are severely taxing institutional capacity to maintain discretionary programs. Shifting federal support from the social sciences makes social science investigators in universities more dependent on institutional resources. Unmet research capacity maintenance problems combined with cost-sharing requirements in the system for support of research in sciences and engineering have become a serious drain on institutional resources and compete with institutional needs for supporting research in the social sciences and humanities.

The universities, the private sponsors, and the government will need to attend to these emerging problems.

Difficulties in the Funding Instruments

The funding instrument difficulties the Commission identified are of two types: difficulties with certain terms of the agreements and difficulties related to the underlying relationship between sponsor and performer.

Continuity and Stability

Continuity and stability are often missing. One of the most commonly perceived weaknesses in the present system is the lack of continuity. For maximum effectiveness, research projects must operate for a period long enough for serious accomplishment. Effectiveness can be impaired seriously if research is forced into short-term planning and funding cycles. In many basic research fields, annual or biannual renewal cycles are simply too short to permit acquisition of equipment and supplies, staffing for the research activity, and implementing the research strategy. Longer periods of assured support are vital. The National Science Foundation and the National Institutes of Health have been moving in the direction of better continuity by using grant periods which average two to three years. However, some agencies continue with one year support. Much of the time devoted to development and review of frequent renewal proposals is time diverted from performance of research. Where it is possible to design longer support into the system, the cost effectiveness of the whole enterprise can be improved.

Part of the continuity problem is associated with delays in renewal of support for ongoing programs. Such delays create funding gaps. When this occurs, either work must cease or support must be transferred from some other source. Universities commonly look to internal sources to underwrite the project temporarily, if eventual renewal of the project seems assured. At best, this leads to the burdensome paperwork of cost transfers to the renewed contract; at worst, it leads to non-reimbursement of costs incurred in the funding gap if the contract is not renewed or if it fails to include the gap within the new contract period or to authorize pre-award costs. On the other hand, if work were stopped and personnel dismissed when funding gaps occur, research progress would be significantly disrupted and delayed. It should also be noted that cost transfers associated with funding gaps are frequently at the root of accountability problems in the administration of research funds.

While some agencies are able to avoid funding gaps, many issue the formal notification of award only days before the effective date of the support agreement. This forces the research institutions to unfair and needlessly disruptive practices. Research personnel must be given more stability than such practices allow.

Surely improvements in continuity and stability are in order. Several mechanisms have been used in the past to provide such continuity and stability. These include: forward funding, roll forward funding, and step funding. Each is discussed below.

Forward Funding

The most straightforward continuity mechanism is multi-year forward funding. The original DOD Interdisciplinary Laboratory contracts in the early 1960s provided four-year funding. This had the advantage of assuring support long enough to acquire the personnel and the facilities to put the research project on a sound base. It had the disadvantage of removing flexibility from the funding agency for an extended period. Even two-year funding puts the research project on a base which is much more sound and likely to make possible much more progress than is the case with single-year funding.

Roll Forward Funding

In this mechanism full funding is guaranteed for a period of two or more years. On the basis of a favorable annual review, an additional year's funding is added to the end of the overall contractual period. In this way, the decision to extend support is always made at least one year in advance. This provides the principal investigator or the university an opportunity to plan ahead with assured funding for a long enough period to make effective management possible. The mechanism gives the sponsoring agency the ability to terminate projects in an orderly manner with ample warning to investigators and the institution.

Step Funding

Step funding is a version of roll forward funding which provides more flexibility for the sponsoring agency. Where this mechanism has been used it has typically provided full funding for one or more years, followed by two-thirds funding for the next year and one-third funding for the next following year. Each year the pattern is rolled forward one year maintaining the step feature. From the standpoint of the investigator or the university, a degree of funding for a substantial period ahead is assured. From the sponsoring agency's standpoint, continuity can be assured for three years, with the commitment of only two years' funds. If the sponsoring agency elects to terminate the project, the investigator and the institution have an extended period to terminate the work in an orderly fashion.

Flexibility

Flexibility is frequently inhibited. Unforeseen events often occur in research; new opportunities frequently develop in the middle of a research program. When such opportunities arise, it can be in the best interest of all parties to change direction in order to pursue the new lead. In basic research, the flexibility to alter direction is vital. In applied research and in development, research direction is usually somewhat easier to predict. In these latter areas, flexibility is still important, but is not as major an issue.

For the most effective research performance, such research changes must be accommodated with minimum delay and minimum friction between the project director, the sponsoring agency, and the institution. Some changes involve a renegotiation of the scope of work; others simply involve internal budget realignments. A number of persons in both the government and the universities believe that greater flexibility in the procedures on both sides is needed to facilitate such changes. While this is not entirely a problem of the funding instruments, some improvements in funding instruments may provide greater flexibility.

Another area in the post-award administration of sponsored agreements which needs improved flexibility involves cost transfers between related agreements. The compartmentalization of research support into multiple, discrete projects of limited duration may be advantageous for the selection of what research and which investigators to support. But it sorely complicates management of research funds, institutional planning, and research facility development. Cost transfers are an unavoidable consequence of the current system. The research program of a single investigator or group of investigators may be funded by several individual research support agreements, so that specific costs may be legitimately assigned to one or more individual accounts. Prudent management may require some retroactive reassignment of such charges. Agency program officials often are quite aware of the situation and recognize the validity of such adjustments among grants for related research. The present post-award administration procedures, however, make such adjustment burdensome in paperwork and require careful justification to avoid disallowance by auditors who tend to view all cost transfers as suspect.

Not all cost transfers are proper. Care must be taken to distinguish those which are legitimate and represent wise, intended use of public funds from those which are opportunistic. The critical element is a clear understanding about the scope of the intended purpose. If the purpose is defined too narrowly, the research productivity of the nation can be unnecessarily impeded. If it is defined too loosely, federal funds may be used for other than their intended purpose.

The problem of cost transfers to cope with funding gaps has already been described in the discussion of continuity and stability. Creative solutions to these problems which both fit the research process and assure appropriate use of federal funds will enhance research productivity and reduce the potential for actions which create negative audit findings.

Procurement Procedures

Procurement procedures are inappropriately used in research support. There is a widespread belief among university investigators and university research administrators that procedures and attitudes appropriate for procurement contracts are beginning to dominate sponsored agreements for basic research. They see clauses from federal procurement regulations designed for industry entering increasingly into agreements with universities. Even though clauses designed specifically for universities have been developed, industrial-type default clauses, stop work clauses, security specifications, and procurement-style reporting requirements are increasingly used in research agreements in what are perceived to be inappropriate ways. University scientists and administrators tend to believe that while contract administration in the various agencies was formerly done by scientists, now procurement specialists, trained in the procurement of deliverable products, are administering research contracts. The problem is seen as a particularly serious one in the case of solicited proposals where the Request for Bid provides all the contract language, and if the university raises an objection to the proposed terms, the bid may be viewed as nonresponsive.

On the agency side, the impetus to write tighter contracts appears to be a response to recent allegations of fraud, error, and abuse in university research operations. Undoubtedly, it is also an agency response to limited resources and perceived congressional and public pressure for agency responsibility.

The universities' concern is that the industrial model of tightly drawn advance specifications is gradually being imposed on an undertaking which can only realistically and successfully be pursued on a best effort basis. Much of the federally sponsored research in universities simply does not need and cannot thrive with the hard edge of the procurement policies and procedures.

The universities, of course, do not have to accept contracts which they view as unduly restrictive. The procurement regulations specify a required core of clauses. To a certain extent contract clauses are negotiable, but the university risks losing the prospective research support completely if the negotiation is pursued too vigorously. At best, such negotiation on a contract by contract basis takes time and requires personnel, which increases administrative costs and impedes the progress of research.

As mentioned previously, the recently enacted Federal Grant and Cooperative Agreement Act of 1977 is intended to provide clarification for such matters. The implications of the Act in the management of federal assistance programs have been explored in a study mandated by the Act and conducted by the Office of Management and Budget (OMB). The final report of this study[6] became available just as the present Commission report was being completed. The Commission has consequently not had an opportunity to study it carefully and to comment on it in this report. We are hopeful that the Act and the study report will have a positive effect on sponsored research agreements between the government and the universities.

The Federal Grant and Cooperative Agreement Act makes clear that the distinction between "assistance" and "procurement" should be reflected in the type of funding instrument used. However, there is some concern in the research community that cooperative agreements as defined in the Act may become a common form of supporting basic research in the universities with the implication of much more widespread federal involvement in the conduct of the research. There is also concern that Department of Defense agreements will become more restrictive if that Department remains unwilling to use grants rather than contracts for support of basic research. One key to the problem is the development of a more widespread understanding and consensus about the nature and expectations of the grant relationship. In supporting research by way of grants, the government is *not* bestowing gifts, favors, or charity on institutions or individuals. It is building and renewing public investment in an important public asset. The government receives a valuable return for its investment.

Research grants are, for the most part, provided on a cost-reimbursement basis. As the Commission pointed out in its report on accountability,[7] despite differences in the nature and purpose of grants and contracts, both types of instruments are subject to the same set of cost principles. These cost principles were adapted from commercial cost principles and fit a procurement mode. The Commission recommended in its first report that accountability requirements be carefully tailored to the nature of the activity. It may well be that the most appropriate approach for grants for basic research would be for them to be offered on a grant-in-aid basis, rather than on a cost-reimbursement basis. Such an approach would shift the emphasis from analysis of costs and examination of documentation for validation of costs to evaluation of scientific efforts and results. The stringency of the review system for renewal of support and the relatively modest sums involved mean that such an approach represents very little risk to the university or the government. It could offer substantial savings in administrative costs.

There are several important issues involved in the choice of the funding instrument to be used. These include: who (the sponsor or the investigator) defines the research problem and objectives, whether the objective is to meet a need of the Federal government itself or to pursue a broader public purpose, the extent of federal involvement in or control over performance of the work, the congruence of the administrative requirements of the agreement with the nature of the activity, and the consistency of administrative procedures applied in federal programs. The universities, the researchers, and federal agencies tend to agree that these are the important issues, but they differ as to what is the overriding issue.

For the investigator and the university, the key issue is the congruence of the scope specificity and administrative requirements with the nature of the activity. For the federal sponsor, the key issue is whether the objective is to meet a need of the government itself or to encourage pursuit of a broader public purpose.

The challenge, therefore, is to develop funding instruments and a system of guidance for their use which can simultaneously accommodate the principal concerns of both sponsor and performer. The system must also be able to accommodate the wide variety among performers.

Cost Sharing

Diversity in cost-sharing requirements and differences in underlying rationale cause complications. The requirement for cost sharing in federal research grants to educational institutions is embodied in a provision in congressional appropriation acts for HEW, DOD, and the independent agencies:

> None of the funds provided herein shall be used to pay any recipient of a grant for the conduct of a research project an amount equal to as much as the entire cost of such project.

This requirement originally was introduced to replace statutory limitations on the amount of indirect costs educational institutions could recover. The intended purpose was to help assure efficient utilization of resources available and to promote sound planning and prudent fiscal policies.

Now almost fifteen years later, federal agencies differ significantly in how the cost-sharing requirement is imposed, what purposes it is intended to serve, and to what extent the institution must share in the costs. Some agencies provide for sharing on an institution-wide basis, negotiating institutional cost-sharing agreements. Others require documentation of cost participation on a grant by grant basis. Programs within agencies will also vary in the amount and purpose of the cost sharing required. For the National Science Foundation, the rule of thumb has been more than one percent cost sharing on research grants, but as high as 50 to 60 percent in equipment grant programs. In the NEH Research Division obligation varies from program to program, with minimum levels now ranging from 20 to 40 percent. NASA recently implemented a much less stringent interpretation of the legislative cost-sharing requirement based on discussions of legislative intent.

In recent years, spreading limited federal resources has emerged as a rationale for cost sharing. In some agency programs it seems to be the primary rationale. Cost sharing also serves as an "entrance fee" for participation in the federally sponsored research support system. In some cases, this entrance fee rationale slides into a form of cost competition. But true cost competition is not involved, since the competing proposals address not a single set of objectives but different, investigator-identified research problems.

These variations in rationale and requirements complicate the government-university research relationships and lead to some of the misunderstandings which are presently undermining its effectiveness.

In 1972, the Government Procurement Commission recommended to Congress that cost sharing be eliminated on research and development projects, except in cases where the performer of the project would clearly benefit, for example, through economic benefits or commercial sales. That Commission further recommended that the decision with respect to placement of research and development contracts or grants should *not* be influenced by potential involvement in cost sharing.

Later, in recognition of the costly and unproductive paperwork burden associated with documentation of cost sharing, the Federal Paperwork Commission reiterated the Government Procurement Commission recommendation to remove the requirement.

Despite these recommendations, cost-sharing requirements persist. Furthermore, the extent of cost sharing required seems to increase gradually, and the recently revised OMB Circular A-21 which sets out cost principles governing research awards imposes additional documentation requirements.

The question must be asked: Do present cost-sharing practices represent a wise approach for the support of research and for the health of the government-university relationship?

Indirect Costs

The administration of indirect cost reimbursement can be improved. A source of substantial strain within universities supported by federal research funds, and also more generally within the government-university research relationship, is the administration of indirect cost reimbursement. The indirect costs are real, the mechanism for computing indirect cost rates is spelled out in detail in OMB Circular A-21, and the rates which prevail are negotiated and agreed on by the university and the designated federal auditing agency. Nonetheless, many university researchers and federal program officers view university administrations' efforts to recover indirect costs as diverting research funds for purposes unrelated to research. The problem is exacerbated by indirect cost averaging on a university-wide basis. This puts a mathematician with little demand for overhead services on the same basis as the physicist with heavy demands for technical and other services which burden the indirect cost pool. While this problem is partly a university one, the Federal government in its administration of research funds can do more than anyone else to relieve the strain and to make the entire research effort run more smoothly.

In the National Institutes of Health, indirect costs are reimbursed separately from direct costs. Consequently, indirect cost reimbursements are normally not perceived to be in direct competition with direct research funds by investigators, agency program officers, and peer reviewers. The Commission believes that if other agencies, in particular the National Science Foundation, adopted the NIH approach to indirect cost reimbursement, substantial strain within the government-university research relationship could be eliminated.

Proposal Preparation and Review

Research manpower resources to prepare and review proposals are substantial and growing. One of the limitations of the individual project grant mechanism for support of research is the fact that considerable research manpower is required for the preparation and review of proposals. The research productivity cost of this burden must be considered. Various alternative mechanisms of support have been considered to reduce this cost and to meet other objectives. Some of these are now available, as described earlier in this document. The individual project system, however, has always enjoyed strong support among the investigators themselves. Several evaluations of the system have been undertaken over the years, with the principal result being an endorsement of the virtues of the system. The separately published results[8] of the Commission's review and discussions confirms that conclusion, but indicates that adjustments to that system should be made to reduce the effort consumed by proposal preparation and review. Recent federal agency moves to limit the length of proposals will help. Adjustments in the length of support period and streamlining the process for requesting continuation or renewal of support should also be explored.

Collaboration

Interdisciplinary and industry collaborative research need more effective approaches. While funding mechanisms and funding instruments are not the principal barrier to improvement of our capacity for effective interdisciplinary research and university-industry research collaboration, new concepts in funding mechanisms and instruments may be required to accommodate efforts toward these ends. Experimentation with new approaches offers the opportunity to explore and test the results.

Manpower Development

The close relationship of performance and manpower development justifies their linkage in research funding. Research experience has become an essential part of the education of students who will become scientists or scholars and also of many who will enter applied science or other research professions.

The involvement of students as research assistants on faculty research projects provides needed assistance to the faculty while giving valuable experience to the students. The value of research participation to students is enhanced when the projects address problems of high significance, as is often the case with federally supported research. The students provide a stimulus which enhances the research environment in universities. They represent a continuing flow of new minds. They bring questions, suggestions, challenges, and new ways of looking at data. Their thinking is not yet habitual. Their exposure to many new topics makes them able to see relationships and to draw analogies which experienced researchers can miss. Furthermore, the act of teaching by faculty members, whether in the classroom or in research supervision, forces reexamination of fundamentals and deepens the teacher's understanding.

Fluctuations in federal research support require an elasticity in the personnel pool which is partly provided by the availability of graduate students. Regular employees, such as research technicians, require a more stable employment structure and are not as adaptable to varying levels of support as are graduate students.

For all these reasons, therefore, the coupling of research and graduate education is clearly advantageous.

In addition to this substantive coupling, there is another facet of the symbiosis between research and graduate education which is related to funding mechanisms. Federal research training grants have the primary objective of developing research manpower, but they also contribute to research productivity through the trainee's research. Federal research grants have the primary objective of research performance, but also contribute to research manpower development through the participation of students as research assistants. It is therefore important that Congress, federal agencies, and universities recognize that adjustments in either of these mechanisms to address changing priorities related to their principal purpose will have impact beyond that immediately intended. They must also recognize the value and complexity of the symbiosis when issues of scientific and financial accountability are addressed.

University-Based Research Centers: A Growing Issue

In addition to the problems which the Commission has identified in the array of funding mechanisms and within the funding mechanisms themselves, attention should be drawn to a related issue which deserves more careful consideration from both the government and the research universities. This is the evolving role of university-based research centers in the national research enterprise.

For the most part, university scientists have combined teaching and research duties, with relatively few academic scientists working in purely research roles. With the decline in the size of the college age population and the consequent decline in the demand for teachers of science in the universities, academic job opportunities for young scientists inevitably will be limited for some time. This raises the question of maintaining the scientific research capability of our country at an adequate level in the face of potential declines in the capability of one of the current major performers and in the supply of young researchers.

There are several possible ways to deal with this issue. One way would be to shift more of the basic research burden to industrial laboratories, but this does not seem to be a likely possibility. With a few notable exceptions, industrial research and development laboratories have shown little interest in supporting or performing basic research.

Another way is to develop a series of research institutes outside the universities, sponsored by the Federal government, much as is done in West Germany. While this can be an effective means for accomplishing research, as the Germans have demonstrated, it divorces research from teaching. One of the advantages of the American system as it has been in the past is the close association of research with teaching and particularly with the teaching of graduate students. Not only is the scientific output of research scientists plus postdoctoral fellows plus graduate students greater than would be the research output of research scientists alone, but the system also produces the next generation of scientists in an effective apprenticeship setting. There has also been a substantial national investment in research facilities in the universities. It seems unwise to allow this investment to lie fallow.

A third possibility is the development of increased numbers of research institutes in university settings. This would keep research and teaching close together, with all the attendant advantages. However, a number of difficulties are already apparent in universities where such research institutes exist in significant numbers. They tend to result in the creation of a parallel-track staff of researchers who do not share the responsibilities and prerogatives of the regular faculty who teach and participate in university governance in addition to doing research. Counterproductive conflicts between these two classes of researcher can arise, as well as conflicts between the research institutes and disciplinary departments.

Another set of problems results from the necessity of developing administrative procedures for research institutes which in many ways differ from and conflict with the traditional decentralized administrative structures of universities.

The general question of how research universities can and should continue to play their role in the national research enterprise, in the face of coming economic and demographic strains, without sacrificing the structural characteristics which have been responsible for their past success, is a serious one deserving careful attention by both government and the research universities.

Conclusions

The Commission has studied the system of federal funding mechanisms used in the distribution of the nearly $4 billion per year supporting university-based research. It has examined the strains which appear to exist in this system in hopes of identifying modifications which will improve its effectiveness. On the basis of the Commission's interviews with many researchers and administrators from both the government and the universities, as well as its review of materials developed by others on this matter, the Commission has reached the following conclusions:

1. *Essential Elements*

For effective functioning of the research support system, the following key elements are essential:

- Fundamental agreement about the nature and purpose of the government-university relationship
- Diversity of sources, mechanisms, and instruments for research support and diversity of research performers
- Investment in both near-term and long-term objectives
- Provision for beginning new ventures and sustaining research capacity
- Continuity and stability of support
- Flexibility for effective technical and fiscal management
- Opportunities for new investigators
- Enlistment and training of future investigators.

2. *Character of Agreements*

Investigators, the universities, and the government need to develop a better understanding of the nature of the government-university research relationship and the purpose of the specific research agreements they make. The terms of such specific agreements must (a) contribute to the welfare of the relationship, (b) reflect the purpose of the agreement (whether procurement or assistance), (c) fit the nature of the activity to be undertaken, (d) call on the capacity of the recipient for responsible management of the activity, and (e) accommodate the diversity of the research performers and sponsors.

3. *Unresolved Problems in a Basically Sound System*

While the current system of research support mechanisms is basically sound, there are unmet needs which must be addressed and problems which need to be resolved. These include:

- A rapidly developing equipment inadequacy problem exists.
- Provision for new research initiatives and for sustaining research capacity is inadequate.
- Institutional support for research in the humanities and social sciences is eroding.
- Continuity and stability are often missing.
- Flexibility is frequently inhibited.
- Procurement procedures are used inappropriately in research support.
- Diversity in cost-sharing requirements and differences in underlying rationale complicate the government-university research relationship.
- Administration of indirect cost reimbursement can be improved.
- The fraction of the nation's research manpower resources being used to prepare and review proposals for research support is substantial and growing.

- Effective ways of approaching interdisciplinary research and collaborative research between universities and industry still need development.
- Complexity of the symbiosis between support of research and development of research manpower is not fully appreciated; nor have we yet learned how to control it successfully.

4. Continuing Experiments

Continuing experimentation with new and modified funding mechanisms and funding instruments should be encouraged to improve the research support system. The effectiveness of the system depends upon its adaptability to changing needs and a changing environment. The development and implementation of new concepts and new modes of research support therefore should be a permanent item on the agendas of federal agencies and the universities.

Examples of areas in which experimentation could now be useful include:

- Methods to improve the stability and continuity of support
- Ways to reduce the burden of proposal preparation and review
- Ways to increase research flexibility and reduce administrative costs.

5. Mismatched Expectations

In the government-university research relationship, a small number of unresolved issues is frequently the source of mismatched expectations and misunderstandings. Even though some of these issues may be clearly resolved at the policy level, they persist at the operating level. Examples of such unresolved issues include:

- The proper locus of control for the most effective basic research
- The extent to which support of research in universities is intended to serve the dual role of meeting research needs and developing research manpower
- How and why the universities and the government should share the costs of basic research.

6. Complexity

The government-university research enterprise is a complex, multi-faceted system. Unfortunately, few participants in the enterprise comprehend the whole system or recognize the extent of its complexity. It is easy, therefore, for its problems to be oversimplified and for the potential impact of their solutions to be misjudged. One example is the complexity of the relationship among the nature and balance among the funding mechanisms, research productivity, and the development of research manpower.

7. A Forum: Refining the Concept

In its first paper, *Accountability: Restoring the Quality of the Partnership*, issued in March 1980, the Commission presented a preliminary suggestion for a Forum of individuals concerned with the government-university research partnership. This was presented in a separate section of the report, entitled, "Toward Improvement: An Evolution." The separate presentation emphasized the view that the Forum concept related to all the work of the Commission, not only to accountability issues. The Forum would "see the relationship *as a whole*, and guide its evolution in directions that assure its strength and vitality." The Forum suggestion was offered to stimulate ideas and discussion. The proposal is:

> The Commission suggests the establishment of a new and independent Forum, as an experiment for five years. The Forum should provide a non-adversarial setting for persons from the public, Congress, universities, and federal agencies to watch over the government-university relationship and guide its evolution.

Since publishing this suggestion, response to the concept has come from many sources, including agencies, associations, the Congress, and universities. Most reactions are highly positive and strongly supportive. Considerable discussion as to the proper mission, locus, organization, membership, and activities of a Forum has begun.

The Commission is gratified with the character of this response, as it believes that broad and careful consideration throughout the government-university research community must precede the establishment of a successful body in response to its suggestion. In order to maintain and expand the dialogue on the Forum proposal, and to report the supportive character of the initial reaction, the Commission reiterates the suggestion in this report.

Based on these developments, the Commission concludes that further refinement of the Forum proposal should continue through discussion and appropriate actions by interested parties.

Recommendations

1. Equipment Obsolescence

The Commission recommends that the federal agencies and the universities adapt funding mechanisms and improve priority-setting strategies to solve the growing problem of research equipment obsolescence.

The Commission has considered the deteriorating research equipment situation. Steps must be taken soon to address this problem if the American research enterprise is to remain efficient and competitive internationally. Ideally, new funds would be appropriated to this end, but in a period of level or declining funding, there is no way to approach the problem without diverting a fraction of the funds presently going into support of people engaged in research activity. Undesirable as such diversion might be, the Commission believes it is necessary.

The responsibility for allocating the necessary funds falls on the universities, the government, and the scientific community. The universities can cope with this massive problem only in modest ways, but it is important for them to accept as much of the responsibility as possible. Federal agencies should place a clear priority on responding to well justified equipment requests through the regular funding mechanisms. This alone, however, will not be enough to halt the rapid deterioration of the national research equipment inventory. The Commission believes that for at least the next few years special supplementary measures will be necessary. Targeted equipment grant programs such as the ongoing NSF Research Instrumentation Program in chemistry and the recent one-time program in the National Institute of General Medical Sciences (NIGMS) offer models that should be adapted by other agencies.

Since the problem is so large, it is important to establish priorities among equipment needs. The knowledge and experience of the scientific community is essential to help the government and the universities establish priorities and to develop plans for equipment acquisition and use. The High Energy Physics Advisory Panel (HEPAP) and the Nuclear Science Advisory Committee (NUSAC) have played central roles in their fields in establishing national priorities for construction of large experimental facilities. Similar functions have been served by *ad hoc* groups in other fields, as in the case of the Dicke Committee in radioastronomy several years ago. These successful examples lead the Commission to suggest that such groups be established in other fields to advise the government and the universities on priorities among equipment needs and between equipment needs and other competing needs.

The government and the universities must develop incentives and strategies for effective sharing of equipment at both the local and regional levels. They must remove the obstacles to sharing which presently result from certain accountability requirements. They must also recognize that sharing of equipment can be constrained by the cost of renovation to provide co-location of users, by highly specialized use, and by the impracticality of transporting unstable experimental samples or auxiliary equipment to centralized or remote sites. Researchers must overcome their natural "territorial instincts" in acquisition and use of research equipment. It is especially important to include good cost-benefit analyses in the development of sharing strategies so that the advantages of sharing acquisition and maintenance costs are not overshadowed by administrative and operating costs.

Because it is so important to divert the minimum possible amount of money away from current research support to equipment acquisition, imaginative funding devices also are called for. Consideration should be given to debt financing ("mortgages"), with retirement of the debt and interest through use charges to sponsored projects.[9] We believe that research supporting agencies should make clear to investigators, peer reviewers, and universities the acceptability of equipment use charges. These charges would allow timely acquisition of important pieces of equipment while distributing the cost over a convenient time period. In certain situations, particularly in public institutions, it may be possible to promote issuance of revenue bonds. Revolving lines of credit at banks or outright loans may be appropriate. Lease or lease-purchase arrangements offer other alternatives for facilitating equipment acquisition.

Substantial interest charges will characterize many of these approaches and, while reimbursement of interest charges can now sometimes be negotiated in occasional cases, revision of OMB Circular A-21 to permit routine reimbursement of interest charges would greatly facilitate the debt-financing approach to the equipment problem.

2. Stability, Continuity, and Flexibility

The Commission recommends that Congress and the federal agencies develop and implement means to increase the stability, continuity, and flexibility of research support while retaining the capacity to respond to changing national priorities. The Commission offers several specific recommendations to this end.

Basic research is a relatively long-term enterprise, characterized by cumulative building on previous work in the same or related fields. While the continuing opportunity to initiate new basic research projects is an essential element in the overall national research program, changes in national needs have far more impact on applied research and development directions than on basic research. For this reason, provisions for the continuity and stability which enhance basic research productivity can be implemented with little or no cost in overall program flexibility.

Duration of assured support is one critical factor for research planning. Frequent competitive review in basic research is often unnecessary. It diverts investigator efforts from active research to proposal writing and review. It complicates the long-term planning by both the investigator and the institution which is necessary for the wise use of resources, facilities, and personnel.

Some agencies, notably NSF and NIH, have designed mechanisms to provide multi-year grants so that research is subjected to the full competitive review process only every two or three years. Some agencies, however, continue to make only one-year awards even where the actual turnover among supported investigators is small. For some agencies, the limitation to one-year awards is based on the one-year congressional appropriation cycle and the agency experience of considerable fluctuation in the magnitude of funds appropriated for basic research. Therefore:

(a) The Commission recommends that Congress consider making a transition to a two-year appropriation cycle for those agencies and components of agencies which support basic research.*

Further:

(b) The Commission recommends that those agencies and components of agencies which support basic research lengthen the average duration of their basic research support agreements to at least two and preferably three years, if they have not already done so.

Also:

(c) The Commission recommends that agencies experiment with authorizing program officers to award a limited number of non-renewable extensions of support at approximately the same level, without the full renewal proposal submission and peer review.

Such extensions would be reserved for those projects which (a) are natural extensions of the previously approved project, (b) are progressing well, and (c) need continuing support. In such cases full competitive review is an unnecessary diversion and wastes the resources of the government, the university, and the researcher.

Another critical factor for research planning is the extent of advance notice of decisions on future research support. In the course of its work, the Commission has encountered many reports of delays in notice of renewal support for ongoing research, notwithstanding that renewal proposals were submitted on time and well before the end of the grant period. Some delays are extensive, lasting weeks and even months after the end of previous award periods. The Commission also learned that notices of new awards and of renewals or nonrenewals are often received within days of their effective dates, thus allowing little or no time for orderly planning. Delayed or inadequate notice of decisions on future support imposes serious burdens on performing institutions and researchers. It forces institutions to underwrite federally sponsored research programs without assurance of eventual reimbursement or compensation for foregone interest on the capital advanced, and it slows initiation of new projects.

This problem sometimes results from delays in the congressional appropriations process. To some extent, short lead times in notices of support decisions are a result of efforts to minimize the time between the submission of a proposal and the initiation of the work. This is clearly the case where an external peer review process is used. However, a significant part of the problem appears to be due simply to administrative inadequacies in the agencies.

For individual research project grants or contracts, an average duration of two to three years of support would allow reasonable stability, provided it is coupled with an adequate, advance notice of the decision on future support. Therefore:

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*Federal agencies typically operate on a one-year appropriation cycle. Most agencies must expend their funds in the year for which they are appropriated. NSF funds are available for expenditure for a two-year period. This extended availability does *not* contribute as significantly to a solution as would a biennial cycle.

(d) The Commission recommends the introduction of incentives for funding agencies to provide more timely notices of awards.

The Commission offers two specific suggestions: (1) three-month extension of research support at the same level would be provided to continuation or renewal proposals if the principal investigator meets the agency deadline and the agency fails to provide notice of the funding decision at least thirty days prior to the end of the current award period; (2) imputed interest costs would be allowed for use of institutional funds to continue a project for which the agency award is so delayed.

(e) The Commission recommends that agencies which fund large research programs build in forward-funding mechanisms or devise new ways to cushion the impact of termination of support.

For individual research project grants or contracts an average duration of two to three years provides reasonable stability. While nonrenewal of support for such a project is always disappointing, the impact is usually quite localized. Nonrenewal of support for a large research program grant or a center grant, however, has a significant impact on both individuals and the institution and requires considerable advance planning. Special mechanisms to provide adequate lead time for an orderly phase-out are necessary to limit destructive disruption. Such mechanisms have been used successfully by federal agencies in the past. For example, NASA and DOD have used the step-funding and roll-forward funding mechanisms to good advantage.

3. Research Capacity and Initiatives

The Commission recommends that the government and the universities work together to develop or adapt a funding mechanism to sustain the research capacity of universities, especially their capacity to undertake new research initiatives.

A responsibly managed research enterprise, whether at the national or the institutional level, must provide for sustaining research capacity and for seed money to support new research thrusts. Although the present system of mechanisms for funding university research is supple and diverse, it fails to provide adequately for these needs. The Commission recommends that the government and the universities together remedy this lack.

The present heavy reliance on individual research project support in the government-university research enterprise encourages and often demands a rather fine grained compartmentalization of both scientific effort and funding. This, in turn, leads to voids and discontinuities in the funding available from external sources to a research university, to the detriment of smooth and efficient functioning of its research effort. For example, pilot projects must often precede project support. Emergencies and unexpected opportunities arise. Facilities need updating for contemporary research purposes. New investigators must get their research programs launched. Shared research resources must be developed and maintained throughout the ebb and flow of external project support. Provision for these costs is rarely made available through the regular funding mechanisms.

In the past, when the magnitude of the total research effort of the research universities corresponded to a relatively small fraction of their budgets and they were less burdened by financial pressures than they commonly are now, universities frequently found it possible to compensate for these voids and discontinuities from their own funds, as a natural part of meeting their responsibilities for support of research. Today the institutions' capacities fall far short of meeting the needs associated with their greatly increased participation in federally sponsored research. Furthermore, the gap between these needs and the university capacity to meet them is growing. The research programs of a typical research university require tens of millions of dollars annually and may account for a quarter of the institutional budget. At a time when all sources of institutional income are severely restricted, it is extremely difficult for a research university to find the resources to fill substantial voids left by current federal funding mechanisms. This burden lies heaviest on those institutions with the largest commitments to the government-university research partnership.

What is needed is a funding mechanism which can serve as a kind of balance wheel to keep a university research effort functioning efficiently despite the irregular and fluctuating forces caused by other funding mechanisms. We have chosen to label this new mechanism "research capacity support," although other terms would be equally appropriate. We envision a mechanism which would provide funding at a level related to the total federal research and development funding of the institution. Coupling the level of research capacity support to the total federal support provides a tie to the existing quality assurance and selection processes and a connection between need and response. The level of support should probably lie in the range of one to three percent of total federal research support. The analysis required to establish the appropriate level was beyond the resources of the

Commission but will need to be undertaken. Because decisions about the needs to be addressed and priorities among them can adequately and perhaps optimally be made at the local level, research capacity support funds would be allocated by the institution for purposes consistent with general principles established by the Federal government in consultation with the research universities. These principles should include:

1. Research capacity support funds would be used to meet research needs which cannot adequately be met through other funding mechanisms.
2. The distribution of research capacity support among research fields should correspond generally to the pattern of federal research support provided the institution through other funding mechanisms.
3. Allocation of research capacity support funds would emphasize maintenance of research capacity through, for instance, provision of equipment or facilities for shared use by many investigators, and provision of venture funding for new research undertakings.
4. The allocation system would be designed by each institution to suit its own structure, but should meet general quality assurance and accountability standards established by the government in consultation with the research universities.

This research capacity support mechanism should include a provision for demonstration of the institutional commitment to research through a requirement that the federal funds be supplemented by a significant allocation of institutional funds; something on the order of 10 percent of the federally provided research capacity support funds would seem appropriate. It should be pointed out that this institutional participation would also be responsive to government interest in institutional cost sharing. The research universities have long pressed for elimination of cost-sharing requirements imposed by the Congress and by the agencies, not because they oppose cost sharing *per se*, but because they oppose the administrative burden which accompanies these requirements under present systems. Institutional participation in research capacity support funding would constitute substantial cost sharing in a simply documentable fashion.

The Commission wishes to emphasize that it does *not* envision that the creation of a research capacity support mechanism will necessitate "add-on" appropriation of funds over and above normal federal research funding levels. It recognizes that the ability of the Federal government to support research in universities is and will continue to be severely constrained, and the use of such a new funding mechanism can most likely occur only at the expense of other mechanisms. Under current economic conditions, such a mechanism is needed to help universities plan and manage their research efforts. This would allow universities to provide the best research possible with the available funds, maximizing efficiency and minimizing administrative and overhead costs.

4. Assistance As the Predominant Approach

The Commission recommends that the Federal government and the universities adopt the policy that assistance rather than procurement is the appropriate mode for support of university research, except where unusual circumstances specifically justify the use of the procurement mode.

The Federal Grant and Cooperative Agreement Act (Public Law 95-224) distinguishes two modes of federal funding for work performed by non-federal organizations, assistance and procurement. It further defines three types of funding agreements, *viz.*, grants, cooperative agreements, and contracts. The Commission views this Act as one starting point for evolving a better system of funding mechanisms for support of university research and development. In university research, it is important to recognize that activity labels such as "basic research" or "applied research," and funding instrument labels such as "grant," "cooperative agreement," and "contract" should not themselves be the determining factor for the choice of the terms of the agreement.

For the researcher and the university, the key issue is the congruence of the specificity of the scope of the agreement and of administrative requirements with the nature of the activity. For the federal sponsor, the key issue is whether the objective is to meet a need of the government itself or to encourage pursuit of a broader public purpose.

The challenge, therefore, is to develop funding instruments and a system of guidance for their use which can simultaneously accommodate the principal concerns of both sponsor and performer. Such a system must also be able to accommodate the wide variety among performers.

The Commission believes that, for almost all university research activities, assistance rather than procurement is the appropriate support mode. Inappropriate use of procurement procedures creates unnecessary misunderstandings and administrative difficulties for federal agencies and universities alike. This Commission recommendation would require that funding mechanisms used to support university research be tailored to the assistance mode rather than the procurement mode, except in cases where the specific circumstances clearly demand the procurement mode. In other words, selection of the procurement mode ought to require a conscious decision based on explicit justification.

This recommendation is corollary to Recommendation 2a of the Commission's first report on accountability, which calls for development of a "new system for accountability tailored to the nature of the activity being sponsored and based on a set of minimum core requirements applicable to all research agreements. The core requirements would be sufficient for all basic research. Further requirements would be added only for activities of a pronounced procurement character."

5. Experimentation with Mechanisms

The Commission recommends experimentation with new concepts in funding mechanisms as the government-university research relationship evolves. In particular, the Commission recommends experimentation with grants-in-aid managed at the local level.

One objective of the Commission in making this recommendation is to reduce administrative complexity and to focus emphasis on scientific accountability as opposed to excessively detailed fiscal accountability. The extraordinary care given to the selection of research projects to be funded, and the critical role which past performance plays in decision for renewal of support, provide a reliable test of scientific accountability, and provide a good opportunity to experiment with alternate fiscal accountability approaches. In the Commission report on accountability, Recommendation 8 calls for delegation of more authority to the universities for budget and management decisions under sponsored agreements.

The Commission urges experimentation with another approach to the same problem, *viz.*, use of grants-in-aid. This would be an award made in response to a normal research proposal including a detailed budget like the current NSF and NIH proposals, but with the accounting to the Federal government limited to scientific reporting, and with the fiscal management delegated to the investigator and his institution. The Commission believes that the incentives for wise management of resources which are inherent in the research funding system reduces the risk of fraud, abuse, or inefficiency to a minimal level.

We suggest that the experiment be designed to test this approach in different institutions and in different research disciplines, beginning at modest support levels and increasing support if the experiment proves successful.

The Commission recognizes that such an approach shifts the locus of budget control from the government to the university and that this shift may introduce intra-university strains. The Commission believes, however, that such strains can be minimized by careful cooperative planning and that the advantages of increased flexibility and reduction in administrative burdens will outweigh any residual difficulty.

The Commission recognizes that this new mechanism might require some adjustments for the calculation of indirect costs, but we believe these will be modest and manageable. The Commission Recommendation 5 in its accountability report for a "standard deduction"—an optional method of deriving the indirect cost component for faculty indirect cost activity—removes a barrier which previously thwarted experimentation with the grant-in-aid approach.

6. Cooperation within Institutions

The Commission recommends that the universities and the government seek ways to promote intra-institutional cooperation in all aspects of research operation. The Commission offers some specific recommendations toward this objective.

There are several ways in which the present government-university research system tends to pit research scientists against their own institutions and to work against cooperation within the institutions. The heavy use of the individual research project support mechanism, for all its strengths for selection of research, has some disadvantages. The combination of its dependency on individual entrepreneurship with its compartmentalization of research support can lead investigators to resist sharing of equipment and other resources. The inability of the universities to provide from their own resources the research equipment and facilities commensurate with the present level of their research activities places the federal agencies and their project officers, instead of the institution, in the role of primary sponsor. Agency program officers occasionally circumvent the government-university contractual relationship and attempt to negotiate directly with the principal investigator on matters which are an institutional concern. These circumstances produce divided loyalties, introduce friction between the investigator and university administrative officers, and undermine the stewardship capacity of the institution. Accountability problems can result from these strains.

The Commission repeats in this report one of the recommendations made in its report on accountability:

(a) The Commission recommends that Congress authorize and the agencies develop arrangements for aggregating research projects for post-award administrative purposes.

Implementation of that recommendation would address a number of current problems, including the problem of arbitrary barriers to sharing costs among related projects and disincentives for intra-institutional cooperation. The aggregation the Commission proposed would preserve fully the appropriate control for the principal investigator.

(b) The Commission recommends that the universities make concerted efforts to reduce internal friction and misunderstanding about indirect costs through education and full discussion of issues.

A major source of friction between investigators and their institutions is the use of federal funds to reimburse a portion of the university's indirect costs. Many institutions have failed to provide adequate information to their research personnel about the nature of indirect costs and the relevance of these charges to the conduct of research. Even where such information has been provided, some investigators continue to believe that such reimbursement represents undeserved "profit" by the universities. Others believe that the averaging method used in distributing indirect costs among projects represents an unfair tradeoff between the cost of more precise accounting and the inequities inevitable in the use of an averaging approach. These concerns not only affect intra-institutional relationships but also influence the thinking in the peer review groups which help select the research to be funded.

(c) The Commission recommends that the method used by the National Institutes of Health for reimbursing indirect costs be adopted by NSF and other agencies which interact significantly with universities.

Since attitudinal change is not a rapid process, some more immediate measures to reduce unnecessary strains seem wise. Under the NIH method, funds are specifically earmarked for reimbursement of the indirect costs of research at the agency level and are segregated from funds for support of the direct costs of research. The funds which are granted for a specific research project then are not immediately influenced by the magnitude of the indirect cost rate or a change in that rate. This decoupling of indirect cost considerations from direct cost considerations is also helpful because it reduces the temptation to make meaningless or misleading comparisons of the indirect cost rates of different institutions.

7. Cost-Sharing and Matching Requirements

The Commission recommends that Congress, the agencies, and the universities reexamine the rationale for cost-sharing and matching requirements in federal programs for support of research in universities to assure that any such requirements are constructive in furthering the mutual objectives of the government-university research relationship.

Formal statutory requirements for cost sharing on research grants were introduced in the mid-1960s when the arbitrary ceiling on indirect cost recovery was removed. The rationale presented then was that such cost sharing would serve as an incentive for wise choices on which research to undertake, for efficient operation, and for cost control. Such cost sharing was also considered appropriate since research is one of the university's regular functions.

As the number and kind of federal programs supporting research and other activities in universities has increased and as the federal programs providing support for activities of state and local governments have grown, expectations and demands for cost sharing or matching have grown and changed. Practices used in one program have been adopted in other programs. In some programs, the principal rationale seems to be to help establish priorities among applicants by testing the grantees' relative commitment, as evidenced by cost sharing. In some programs, the primary impetus for the cost-sharing requirement is to stretch limited federal resources to respond to more applicants. In some programs, the program objective and responsibility for meeting it are shared, and cost sharing reflects this mutuality of interest. In other programs, the cost-sharing requirement is intended to serve as an incentive to stimulate the private sector to provide support. In some situations, however, cost sharing seems to be simply an "entrance fee" to participation in the government-university research relationship. The variation in rationale and requirements for cost sharing complicate the government-university research relationship and undermine its effectiveness.

The Government Procurement Commission recommended elimination of cost sharing from research and development projects except in cases where the performer would clearly benefit, for example, through economic benefits or commercial sales. That Commission further recommended that the decision with respect to placement of research and development contracts or grants should *not* be influenced by potential involvement in cost sharing. The Federal Paperwork Commission reiterated the Government Procurement Commission recommendation because of the costly and unproductive paperwork burden associated with documentation of cost sharing. Despite these recommendations, the requirement persists, new documentation requirements have recently been added, and the amount of cost sharing required seems to be increasing.

In its first report on accountability, the Commission urged Congress to remove the statutory requirement for cost sharing so that the burden of documentation could be removed. The Commission recognized that whether or not there is a statutory requirement, universities and the government will continue to share the costs of basic research.

The Commission also recognizes that it will be increasingly tempting for federal agencies to try to spread resources by requiring greater cost sharing. The resiliency of the universities is greatly diminished and cannot support such demands. Therefore, Congress, the agencies, and the universities need to reexamine the rationale and requirements for cost sharing in federal programs for support of research in universities to make sure that only constructive and necessary requirements are imposed.

8. Additional Science Indicators

The Commission recommends that the Office of Science and Technology Policy and the National Science Foundation (a) develop, employ, and report additional science indicators which reflect the balance and diversity of federal research funding programs and (b) encourage the general use of these indicators in research policy development and planning by government and universities alike.

The Commission has studied the range of existing research funding mechanisms, from individual research project grants to large block grants and institutional grants. It has considered the spectrum of federal funding agencies and the range of research styles from what is known as "little science" to "big science." It is convinced that the diversity of funding mechanisms and agencies which now exists in the United States is a crucial element in the strength of American science. It judges that the present balance among agencies and mechanisms and between little science and big science is not dangerously far from optimum. However, the Commission also recognizes that the degree of diversity and the conditions of balance depend on scientific, economic, and political circumstances, and therefore vary with time. A proper awareness of these factors is essential to government and university policy makers.

The Commission does not consider itself to be in a position to suggest which way the present balance might be shifted. It does believe that more diversity would be far preferable to less. But most of all, the Commission stresses the importance of a general awareness of the state of balance and diversity in the government-university research relationship. This will require information and indicators which reflect the distribution of federal research support across the many different types of funding mechanisms and the variation of the distribution with time. Table I of this report is an example of such an indicator. These should be developed at a national aggregate level and also within individual scientific fields and within federal agencies. Such distributions can be useful indicators of evolving national research policies. These indicators are not commonly available at present.

9. Growth of Research Centers and Institutes in Universities

The Commission recommends that the research universities, individually and collectively, examine carefully the implications for university development, structure, and governance of the growth of university-associated research centers and institutes.

The research universities of the nation face many difficult questions as they confront the financial and demographic realities of the remaining two decades of the twentieth century. Among these is the question whether the universities will find it desirable or possible to maintain their positions as the principal performers of basic research within the national research and development enterprise. This is also a crucial question for the Federal government. If the universities' contributions to the national research effort were to wane while national requirements for research continued to be strong, the government would need to turn to other performers. There are many good reasons why the universities should strive to maintain their capabilities as research performers. There are also cogent reasons to believe that if they are to succeed in doing so, they may need to make some fundamental adjustments in their character. For example, federally funded research and development centers staffed by non-faculty researchers may become much more prominent features of research university campuses than they now are. If this occurs, new conflicts and pressures will surely arise within the universities to develop the role of non-faculty researchers in the university governance structures.

The Commission believes that few universities have given adequate consideration to the possibilities posed by such questions and strongly recommends that they do so. We suggest that the major university associations establish a task group to examine the issues, and that consideration be given to organizing a workshop or conference on the subject to encourage widespread discussion and planning within and among research universities.

Appendix I: References

1. Dupree, A. Hunter. *Science in the Federal Government: A History of Policies and Activities to 1940*. (New York: Harper and Row, 1964).
2. MITRE Corporation. *Evaluative Study of the Materials Research Laboratory Program*. (McLean, Virginia: MITRE Corporation, 1979).
3. Higher Education Panel. *Shared Use of Scientific Equipment at Colleges and Universities, Fall 1978*. Report #44. (Washington, D.C.: American Council on Education, 1979).
4. See, for example:
   Smith, B. L. R. and Karlesky, Joseph J. *The Universities in the Nation's Research Effort*, Vol. I, Summary of Major Findings. (New Rochelle, New York: Change Magazine Press, 1977) pp. 159-216.

   Abelson, P. H. "Obsolete Instrumentation at Universities." *Science*, vol. 200, 1111 (1978).

   Blout, E. R., *et al.* "Instrumentation Funding." *Science*, vol. 202, 381 (1978).

   Princeton University Study of Research Equipment and Facilities Needs in Nine Universities. (Princeton University, 1979).

   Ebel, M. E. and Wilson, L. S. *Survey of Major Equipment Items Needed for Biomedical Research at Ten Midwestern Research Universities.* (University of Wisconsin and University of Illinois, 1978).
5. Berger, M. and Cooper, M. J. "The Cost of R&D Living." *Science*, vol. 204, 1369 (1979).
6. Executive Office of the President, Office of Management and Budget. *Managing Federal Assistance in the 1980's.* A Report to the Congress of the United States Pursuant to the Federal Grant and Cooperative Agreement Act of 1977 (Pub. L. 95-224). (Washington, D.C., March 5, 1980).
7. National Commission on Research. *Accountability: Restoring the Quality of the Partnership.* (Washington, D.C.: National Commission on Research, March 1980).
8. National Commission on Research. *Review Processes: Assessing the Quality of Research Proposals.* (Washington, D.C.: National Commission on Research, May 1980).
9. Olson, George G., Vice President for Research, Colorado State University. Private communication, 1980.

Appendix II: Sources

The Commission is indebted to the many persons who have provided information and advice, and it wishes to acknowledge its appreciation for their efforts. Invited expert witnesses have testified on the issues within the Commission's purview at its monthly meetings; open hearings have been held on five university campuses; subcommittees have met with individuals and groups from the Federal government; and members and staff have attended or made presentations at meetings and hearings convened by educational associations, government agencies, and Congress.

Witnesses. The following individuals presented views and gave assistance in the development of this document. The Commission wishes to emphasize that the views in this document are its own and not necessarily those of the listed individuals. This list includes meetings through March 1980.

Richard Atkinson, Director, National Science Foundation
James M. Banner, Jr., American Association for the Advancement of the Humanities
Robert Barlow, Cornell University
Carl P. Blakley, Department of Energy
Robert M. Bock, University of Wisconsin
Howard W. Bremer, University of Wisconsin
Newton Cattell, Association of American Universities
Honorable Lawton Chiles, U.S. Senator from Florida
Robert Coakley, U.S. Senate Subcommittee on Federal Spending Practices and Open Government
Tom Collins, University of California, Los Angeles
Theodore Cooper, Cornell University
Lawrence G. Crowley, Stanford University
Robert Cutler, National Science Foundation
John M. Deutch, Under Secretary, Department of Energy
Sidney Drell, Stanford Linear Accelerator Center
Marvin E. Ebel, University of Wisconsin
Anthony Egginton, British Science Research Council
Gretchen Engquist, U.S. Senate Subcommittee on Health and Scientific Research
Gary Evans, Department of Agriculture
Kristine Forsberg, Department of Energy
Osmund Fundingsland, General Accounting Office
George Gamota, Department of Defense
Howard Gobstein, General Accounting Office
Delphis C. Goldberg, U.S. House of Representatives Subcommittee on Intergovernmental Relations and Human Resources
Milton Goldberg, Council on Governmental Relations, National Association of College and University Business Officers
James Haas, Council on Library Resources, Inc.
Robert W. Hougas, University of Wisconsin
Richard F. Kaufman, U.S. Congress, Joint Economic Committee
William Kays, Stanford University
Bryant Kearl, University of Wisconsin
Charles V. Kidd, George Washington University

Richard M. Knapp, Association of American Medical Colleges

Philip Kropatkin, Deputy Director, Audit Agency, Department of Health, Education, and Welfare

James Ling, Department of Energy

John Lordan, Office of Management and Budget

David Mears, University of California System

Richard Meserve, Office of Science and Technology Policy

George Millburn, Department of Defense

Bryan Mitchell, Assistant Inspector General, Department of Health, Education, and Welfare

Thomas Morgan, Association of American Medical Colleges

Morton Myers, General Accounting Office

Robert Newton, National Science Foundation

Donald Nutter, U.S. Senate Subcommittee on Health and Scientific Research

George G. Olson, Colorado State University

Gilbert S. Omenn, Office of Science and Technology Policy

George Pake, Xerox Corporation

J. Thomas Parmeter, Michigan State University

Michael Pelczar, Council of Graduate Schools of the U.S.

John D. Phillips, National Association of Independent Colleges and Universities

George Pilarinos, National Aeronautics and Space Administration and National Science Foundation

Dennis Prager, Office of Science and Technology Policy

Frank Press, Office of Science and Technology Policy

William F. Raub, National Institutes of Health

Jerold Roschwalb, National Association of State Universities and Land-Grant Colleges

Halsey L. Royden, Stanford University

Jack Sanderson, National Science Foundation

Reilly Schaefer, University of Wyoming

Helen Schroeder, National Institutes of Health

Reagan Scurlock, Council on Governmental Relations, National Association of College and University Business Officers

Richard Sessions, University of California, Los Angeles

Irving Shain, University of Wisconsin

Philip Smith, Office of Science and Technology Policy

Donald Speer, National Science Foundation

Elmer B. Staats, Comptroller General of the United States

Richard E. Stephens, Department of Energy

Eldon Taylor, Inspector General, National Aeronautics and Space Administration

Richard Tropp, Environmental Protection Agency

Thomas van der Voort, U.S. Senate Committee on Appropriations

David Wilson, University of California System

Raymond Woodrow, formerly of Princeton University

Agency Liaison. These persons have been appointed by their agencies:

Salvatore Cianci, Alcohol, Drug Abuse, and Mental Health Administration
George P. Millburn, Department of Defense
Richard E. Stephens, Department of Energy
Osmund Fundingsland, General Accounting Office
Walton Francis, Department of Health, Education, and Welfare
James R. Lawson, National Aeronautics and Space Administration
William F. Raub, National Institutes of Health
Jack Sanderson, National Science Foundation
Eliot R. Cutler, Office of Management and Budget
Philip M. Smith, Office of Science and Technology Policy

Open Hearings. Over seventy persons testified before the Commission during hearings at the national conference of the American Association for the Advancement of Science and on the campuses of the University of Alabama, Birmingham; California Institute of Technology; Stanford University; the University of Wisconsin, Madison; and the University of Utah with the Inter-Mountain University Research Association. A number of these speakers presented views on funding mechanisms in addition to other topics under consideration by the Commission.

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